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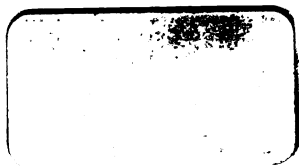
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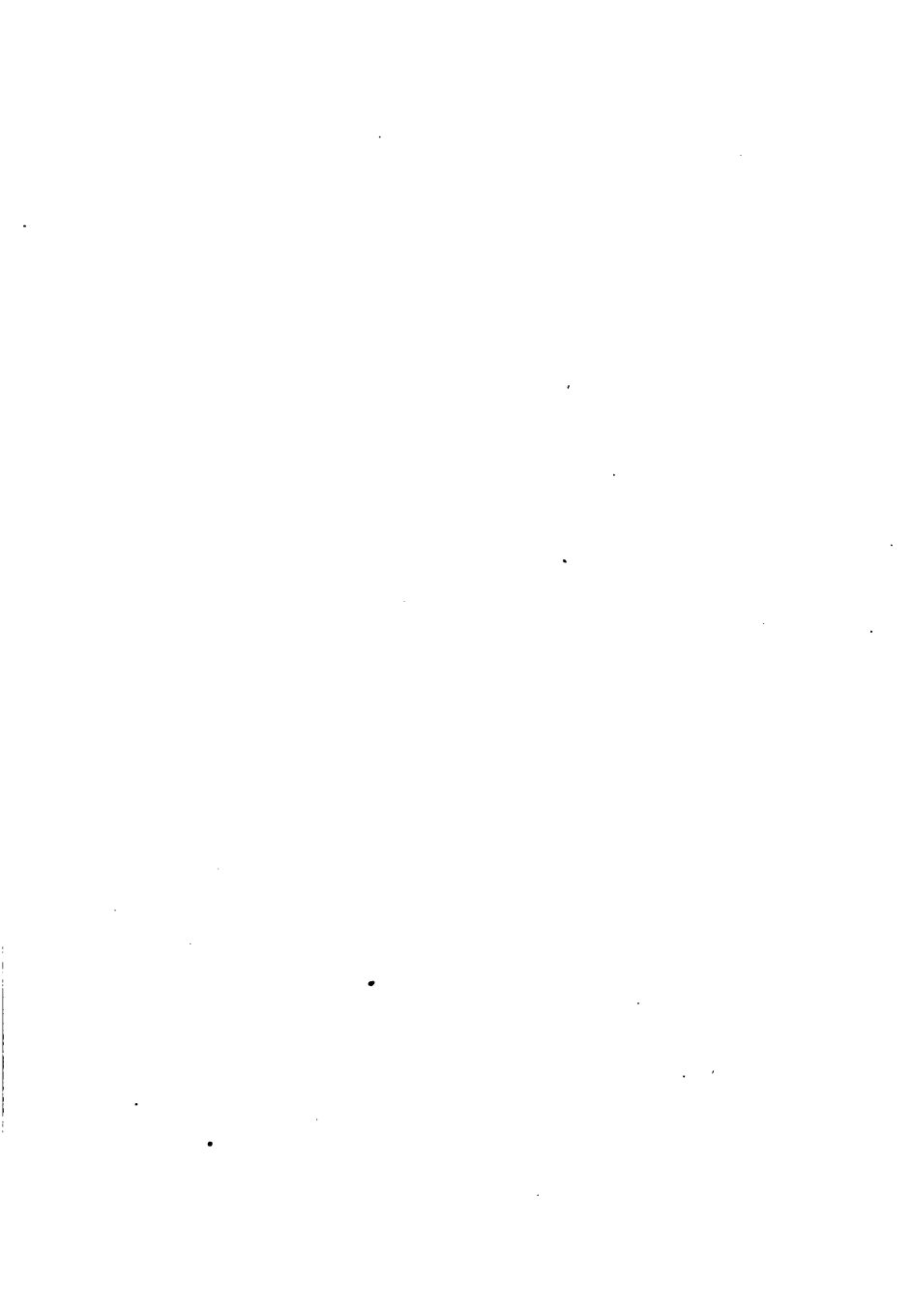
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# ELEMENTARY PSYCHOLOGY,

WITH

PRACTICAL APPLICATIONS TO EDUCATION AND  
CONDUCT OF LIFE,

INCLUDING

*AN OUTLINE OF LOGIC.*

FOR THE USE OF

HIGH SCHOOLS, NORMAL SCHOOLS AND ACADEMIES  
TEACHERS AND THE GENERAL READER.

BY

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## **PREFACE.**

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THIS work is an attempt to present, with applications, the more important principles of Psychology in a clear and concise form, arranged for High and Normal schools and adapted to the use of teachers and the general reader.

The plan of the work, formed several years since, and pursued throughout the period of its preparation, is as follows :

1. The topics are selected for their essential importance, and are treated concisely.

2. Such metaphysical discussion as does not belong to an elementary work is omitted or placed in foot-notes. The importance of Physiological Psychology is duly regarded.

3. Practical applications of the science are made to Education and the Conduct of Life.

4. In connection with Thinking an outline of Logic is presented.

5. The presentation of many of the topics is inductive in the sense that typical instances precede the statement of principles. For emphasis and convenience the definitions and many principles, summaries, and inferences are printed in different type.

6. For fuller views on some of the topics and for

comparison of opinions, references are made to a brief list of available works.

7. Exercises, calculated to test the skill and invite the research of the student, are placed at the end of each subject.

The author believes that *Practical Psychology* has a place in Secondary Schools generally as well as in Normal Schools, because so many of the students of these schools complete their formal education in them, and because so many of them become teachers. In the experience of life every one is in some way a teacher, and every one should have in view at least the further development of his own powers.

This work was carefully read in manuscript by B. F. Hayes, D.D., Professor of Psychology and Logic in Bates College, and the "Applications" were reviewed by one of the most distinguished exponents, in this country, of sound educational theory. The author is indebted to these gentlemen for valuable suggestions; he however holds himself responsible for whatever views are presented in the work.

Many of the volumes referred to in the preparation of this book are mentioned in the list for reference, hence no further acknowledgment of indebtedness to authors is needed than the list itself, and the numerous references in the foot-notes.

The library of every school in which Psychology is taught should contain at least the shorter list of reference books upon the subject. Before beginning this work the pupil is supposed to have studied Hutchison's *Physiology*, or its equivalent.

## SUGGESTIONS TO TEACHERS.

1. If the time allotted for the study permit, the pupil should refer to the authorities indicated in the foot-notes and report his investigations in class; if desired, other authors may readily be substituted for those noted.

2. In many instances the "Applications" should be referred to the principles which they apply; this work is facilitated by the cross-references between topics and applications.

3. The "Exercises" may be increased at the discretion of the teacher. It would be well to mark out illustrative work for each method of Psychological inquiry (see p. 19), and use it as progress in the study may require.

Additional exercises in *Introspection* will readily suggest themselves.

*Study through the words and acts of others* may be illustrated by comparing one's own experience with that of others under similar conditions; by observing the deeds of others in given circumstances; by noting the effect upon expression of success, of a harsh word, of a smile, etc., etc.

*Study of Children* may be successfully invited. Let the pupil observe or learn of early instances of well-defined perception, of implicit judgment, of implicit reasoning.

*Study through Biography, History and Literature* is

easy to illustrate. From results in character infer the motives of some noted man; conjecture his emotional life as determined by certain events; read autobiographical sketches. Analyze the spirit of the French people just preceding the Revolution. Select passages, showing a profound knowledge of the human mind, from the play of "Hamlet;" learn what is implied as to the beliefs of men by their use of common psychological terms.

For *Physiological Study* observe for instance the effect of fatigue upon memory.

In connection with the "Applications" Discussion of the *Theory and Practice of Teaching* may be carried to any extent.

While work of the kind suggested above is an essential part of the true method in Psychology, it should not be regarded as in any sense a substitute for systematic text-book work.

4. The sections numbered 59, 60, 65-69, 72-87 are devoted to Logic; it is thought that most schools will desire to use the amount of Logic here presented. The belief is growing that no course of secondary instruction is complete which omits the principles and forms of Logic and examples of the fallacies into which people are easily led. It is hoped that this feature of the book will especially recommend it. In connection with this outline some such work as Jevons' Primer of Logic, in the hands of the teacher, will prove suggestive and helpful.

5. The "Table of Contents" is a complete analysis of the whole subject by sections and paragraphs, and it may be followed in formal recitation.

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## APPENDIX.

### THE INTUITIONS.

#### LIST OF BOOKS TO WHICH REFERENCES ARE MADE.

- \* The Human Intellect.—Noah Porter.
- \* Outlines of Psychology.—James Sully.
- \* Lectures on Metaphysics.—Sir William Hamilton.
- An Essay Concerning Human Understanding.—John Locke.
- On Intelligence.—H. Taine.
- \* Mental Science.—Alexander Bain.
- The Principles of Psychology.—Herbert Spencer.
- The Cognitive Powers.—James McCosh.
- Introduction to Psychological Theory.—Borden P. Bowne.
- The Intuitions of the Mind.—James McCosh.
- The Motive Powers.—James McCosh.
- \* Philosophical Basis of Theism.—Samuel Harris.
- A Vocabulary of the Philosophical Sciences.—Krauth-Fleming.
- \* Principles of Mental Physiology.—William B. Carpenter.
- \* Elements of Physiological Psychology.—George T. Ladd.
- Mind and Body.—Alexander Bain.
- The Brain and its Functions.—J. Luys.
- The Brain as an Organ of Mind.—H. Charlton Bastian.
- A System of Logic.—John Stuart Mill.
- \* The Elements of Logic.—W. Stanley Jevons.
- The Laws of Discursive Thought.—James McCosh.
- Science of Thought.—F. Max Müller.
- \* Education.—Herbert Spencer.
- \* Education as a Science.—Alexander Bain.
- \* The Philosophy of Education.—Rosenkranz. (Trans. by Anna C. Brackett, edited by Wm. T. Harris.)
- \* Lectures on Teaching.—J. G. Fitch.
- Life and Educational Works of Comenius.—S. S. Laurie.
- \* Locke on Education.—(Edited by R. H. Quick.)
- Habit in Education.—Paul Radestock. (Trans. by Caspari, introduction by G. Stanley Hall.)
- Emile.—Jean Jacques Rousseau. (Trans. by Eleanor Worthington.)
- Levana.—Richter. (Trans.)
- The Philosophy of Education.—T. Tate. (Introd. by Francis W. Parker.)
- \* Elements of Pedagogy.—Emerson E. White.

\* As a short list of books for reference these are recommended.

# PSYCHOLOGY.

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## INTRODUCTORY TOPICS.

1. **NATURE OF THE STUDY.**<sup>1</sup> The sun and stars, the solid earth and the fluid air, houses, trees, and animals, our own bodies, indeed all the objects which make up the External World, may be classed together under the one name *Object* or *Matter*. The Internal World which is affected by these objects and perceives them may be called *Subject* or *Mind*.<sup>2</sup>

We do not know the nature of matter, but we define it by its properties thus: **Matter** is that which has extension, impenetrability, inertia. Botany, Physics, Astronomy, etc., are objective sciences which treat of the External World. We do not know the nature of mind, but in like manner we may define it by its properties or powers: **Mind** is that which knows, feels, and wills.

**Psychology** is the science which treats of the Human Mind.<sup>3</sup>

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<sup>1</sup>Bain, *Introd.*, Chap. I.

<sup>2</sup>The Internal World is variously designated as Subject, Mind, Ego, and Self; the External World as Object, Matter, Non-Ego, and Not-Self.

<sup>3</sup>In accordance with common practice *Mind* is here used in the sense in which *Soul* is employed by some writers. The term Psychology is from the Greek words, *psyche*, soul, and *logos*, discourse.



**2. METHODS OF STUDY.**<sup>1</sup> Shut out, as far as possible, the External World, and look within upon the World of Mind ; note what is passing there and recall what preceded. You have surprised some fleeting thought or fancy ; you are aware of various bodily sensations, and of sights and sounds affecting the mind ; you recall some wish or a half-forgotten determination. On this mental field constantly remembrance, fancy, thought, and choice follow in rapid sequence ; hope or fear may arise, claim the attention for a moment, and vanish or merge into a state of gladness or melancholy. These processes may be made as truly objects of observation and study as experiments in Physics or specimens in Botany ; our mental acts and states may be known and classified.

When studying an objective science, as Botany or Physics, we examine specimens or observe experiments through the senses, and we may continue our examination or repeat our experiments at will. In the experimental study of Psychology the mind as it were looks within and observes its own acts and states. This method of introspection is at first difficult, but becomes easier by practice. Our mental acts are so fleeting and are so disturbed by an attempt to observe them that another difficulty is added to the study, but memory comes to our assistance and brings back our past mental experiences. This method of study just described is the *subjective* or *introspective*.

In addition to the subjective method we may study the minds of others through their words and acts ; we may trace the growth of the child's mind ; we may

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<sup>1</sup> Read Sully's Outlines, Appendix A.

learn the traits, motives, and beliefs of men from biography, history, and literature; besides, we may learn from Physiology much concerning the physical conditions of mental phenomena.

Facts about the mind gathered in these ways and classified constitute the subject-matter of Psychology.

Methods of Studying Mind.	{	Subjective or Introspec- tive.	{	Through the words and acts of others.
		Objective.		Through observation of children.
		Physiological.		Through Biography, His- tory, and Literature.

**3. THE NERVOUS SYSTEM.**<sup>1</sup> It is necessary to study briefly the instrument by which the mind communicates with the External World, namely, the Nervous System. The elements of the nervous system are nerve-fibers and nerve-cells. The nerve-fibers constitute the "white" matter of the nervous system, and the nerve-cells the "gray" matter.

A Nerve-fiber (Fig. 1) usually consists of three parts, an extremely thin outer membrane, a white, semi-liquid sheath, and a translucent axis cylinder. Nerve-fibers vary in diameter from  $\frac{1}{14000}$  to  $\frac{1}{1200}$  of an inch. They serve as lines of connection, uniting

<sup>1</sup> If desired this section can be omitted; but the author believes that it is a necessary preparation for understanding some of the principles of Psychology. The technical terms are few, important and well-known in Physiology.

On this subject read Ladd and also Bastian, referring to index for points treated. Refer to Luys, Part I, Chaps. IV, V, and VI. Additional reference may be made to Carpenter, Bk. I, Chap. II, § 4; Spencer, Vol. I, Part I, Chap. III; Taine, Part I, Bk. IV, Chap. I.

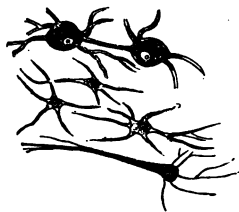


FIG. 1.—Medullated Nerve-fiber, largely magnified. A, axis-cylinder; S, external sheath; M, medullary sheath. (Ladd.)

FIG. 2.—Different kinds of Nerve-cells, largely magnified. (Bastian.)

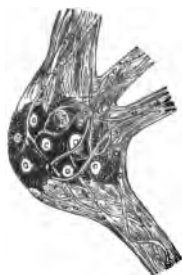


FIG. 3.—Small Sympathetic Ganglion, largely magnified. (Bastian, after Leydig.)

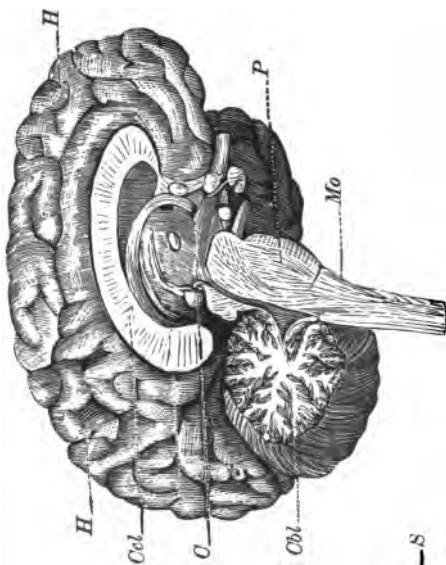


FIG. 4.—Median section of the Brain. Cbl, cerebellum; C, cerebrum; Mo, medulla oblongata; P, pons Varoli; Ccl, corpus callosum; H, left hemisphere of cerebrum. (Hutchinson.)

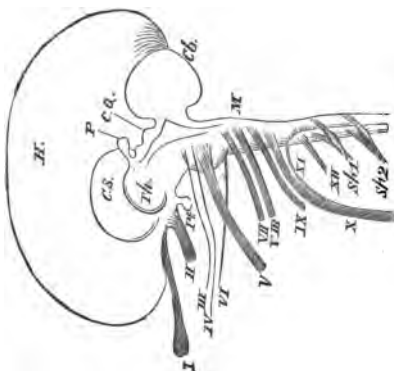


FIG. 5.—Diagram of important parts of the brain. H, cerebral hemisphere; C.S., corpus striatum; Th, optic thalamus; P, pineal body; C.Q., corpora quadrigemina; Cbl, cerebellum; M, medulla oblongata. (Huxley and Yousang.)

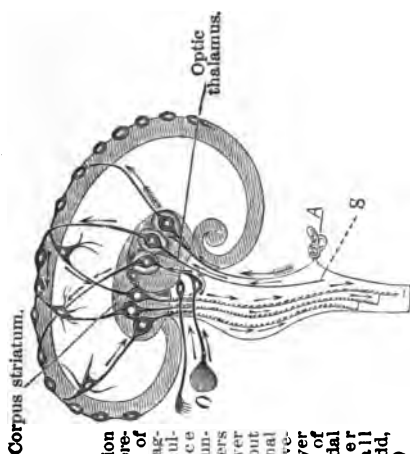


FIG. 8.—Diagram showing course of impressions. *A*, course of acoustic impressions; *O*, course of optic impressions; *S*, course of sensitive impressions. (Lay.)

FIG. 7.—Section through the Cerebral Cortex of Man, largely magnified. *M*, medullary substance sending out bundles of nerve-fibers into II; 1, layer poor in cells, but with an external plexus of nerve-fibers (1\*); 2, layer of small, and 3, of large pyramidal cells; 4, inner layer of small nerve-cells. (Ladd, after Schwalbe.)

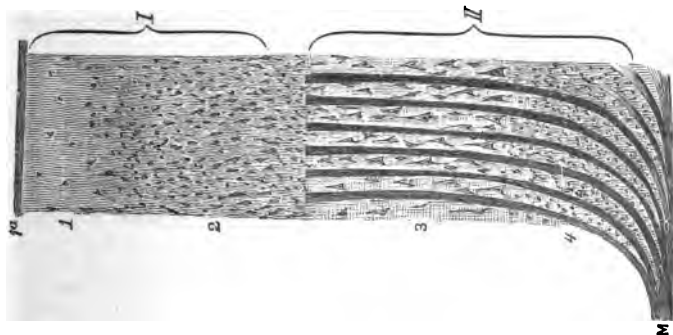


FIG. 6.—Horizontal section through right hemisphere of Cerebrum, showing arrangement of white substance and gray. (Ladd.)



nerve centers and communicating with sense organs, as the eye and ear, and with motor organs, as the muscles moving the arms. Their office is not to originate but to transmit "nerve-commotion." There are two classes, *sensory*, also called *afferent*,<sup>1</sup> in-carrying, which convey impressions from the sense organs to nerve centers, and *motor*, also called *efferent*, out-carrying, which transmit motor impulses from nerve centers to muscles.

A **Nerve-cell** (Fig. 2) is a granular body with a large nucleus and a distinct small nucleus or "nucleolus." One or more projections or "processes" branch from the body of each cell serving to attach cells to each other and to nerve-fibers. Nerve-cells vary in size from  $\frac{1}{3500}$  to  $\frac{1}{250}$  of an inch.

A **Ganglion** (Fig. 3) is a group of nerve-cells with their interlacing fibers, forming a nodule. A group of nerve-cells connected with sensory nerve-fibers is called a *sensory ganglion*; a group connected with motor fibers is called a *motor ganglion*.

A **Nerve Center** is the union of a motor group and a sensory group, forming a compound ganglion. One function of a nerve center is to change a sensory wave, moving along afferent fibers from a sense organ, into a motor impulse, directed along efferent fibers to the muscles. In this case the wave is said to be *reflected* from the nerve center to the muscles and the action is called *reflex*. Reflex action is seen if a person in profound slumber withdraws his hand when it is pricked. The principal nerve centers,

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<sup>1</sup> Sensory nerves are *afferent*, but not all afferent nerves

beginning with the highest, are the *Cerebrum*, the "*Basal Ganglia*" (*Optic Thalami* and *Corpora Striata*), the *Cerebellum*, the *Medulla Oblongata*, the *Spinal Cord* and the *Sympathetic Ganglia*.

The Nerve Centers and their functions are thus described by physiologists :

**Cerebrum** (Figs. 4, 6 and 7). The cerebrum, the supreme nerve center, is situated in the upper portion of the skull. It is nearly divided into two hemispheres. Each hemisphere consists of white matter, composed of nerve-fibers, and an outer coat of gray matter from  $\frac{1}{16}$  to  $\frac{1}{8}$  of an inch thick called the *Cortex*. This cortex may be regarded as a great ganglion composed of many fused ganglia. It has been estimated that there are a billion nerve-cells and five billion nerve-fibers in the entire brain.

**Functions.** The cerebrum is the seat and immediate organ of the mind. Impressions from the external world, acting along afferent nerve-fibers and causing disturbances in the nerve-cells of the cortex, in some unknown way affect the mind. The mind acting through the cerebrum has supreme control of all the voluntary movements of the body.

**Basal Ganglia** ((a) *Optic Thalami* and (b) *Corpora Striata*, "*Striate Bodies*") (Figs. 5 and 8).

(a) The *Optic Thalami* are reddish, egg-shaped bodies situated at the center of the brain. (b) The *Striate Bodies* are gray, pear-shaped masses each situated in the center of its hemisphere. The nerve-fibers emerging from the cortex pass into these bodies.

**Functions.** (a) The principal work of the *Thalami*, as supposed, is receiving sensory impressions and transmitting them, modified, to the cerebral cortex.

(b) The Striate Bodies are supposed to receive motor impulses from the cortex and transmit them, modified, to the muscles.

**Cerebellum** (Figs. 4 and 5). The cerebellum is situated beneath the posterior part of the cerebrum. Its surface consists of gray matter and its interior is composed mainly of white matter.

*Functions.* It is supposed by some to aid in regulating and co-ordinating muscular movements; by others to act as a relay battery and to enforce the motor currents going out from the brain.

**Medulla Oblongata** (Figs. 4 and 5). The medulla oblongata may be regarded as that portion of the spinal cord which is contained in the cranial cavity.

*Functions.* By reflex action it controls wholly or in part the action of the heart, blood-vessels, lungs, etc. It has a share in co-ordinating muscular movements.

**Spinal Cord.** The spinal cord is composed of a gray axis, consisting of fused ganglia, and connecting nerve-fibers and cords. .

*Functions.* It acts as a conductor to and from the brain. It is capable of independent reflex action in case of involuntary movements of the limbs and habitual movements, as walking. By reflex action it exerts a certain control over the organs of digestion and nutrition.

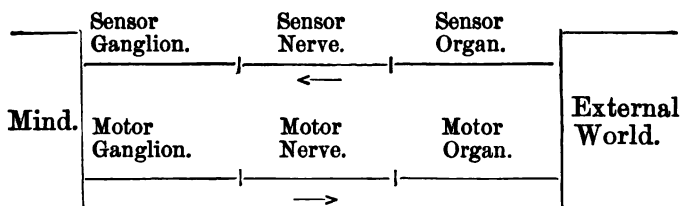
**Sympathetic System.** The sympathetic system consists of a double chain of ganglia situated on either side of the spinal column. These ganglia are connected with cranial and spinal nerves and with organs of the chest and abdomen.

*Functions.* By it many organs of the body are brought into connection and "sympathy" with each

other. By reflex action it controls in part digestion and circulation.

We may now take a general view of the Nervous System.

1. Trace the course of a sound impression as shown in Fig. 8. Air vibrations occasion wave movement in the auditory nerve; this movement reaches the Thalamus, is modified and advances to the cortical cells. The molecular commotion of the nerve-cells in some mysterious way finds a response in the mind. The mind arouses a motor impulse which moves from the cortical cells to the Striate Body, thence advances along a motor nerve to the muscles occasioning motion. The accompanying diagram will present these movements more clearly. It must be noted that sensory nerves and ganglia belong to the External World.

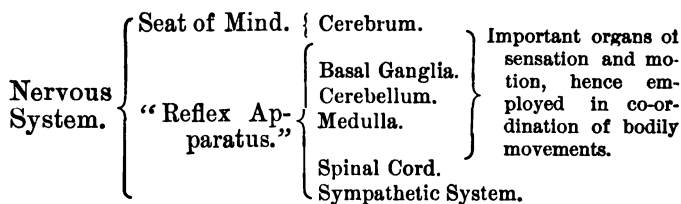


2. Remove the Cerebrum from a frog without injury to the other organs; by using excitants, as a pin or an acid, he is made to perform all the movements of an uninjured frog. There is no sufficient evidence that any of these are conscious movements; they are probably wholly reflex.<sup>1</sup> Examine the facts previously given about the nerve centers below the Cerebrum.

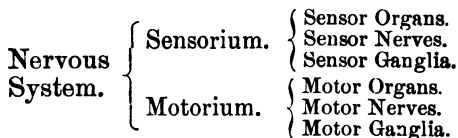
<sup>1</sup> Read Ladd, p. 151.



The Basal Ganglia, the Cerebellum and the Medulla are especially concerned in producing sensation and bodily motion. These organs as a whole are supposed to be capable of reflex action. The Spinal Cord is an important reflex center, and the Sympathetic System, by reflex action, responds to the condition of vital organs. Hence the Cerebrum is the seat of Mind. All the nerve centers below the Cerebrum constitute the "Reflex Apparatus" by which sensation is occasioned and the processes of animal life are sustained. Injury to the Basal Ganglia, the Cerebellum or the Medulla is likely to produce irregularity of bodily movements, such as difficulty in walking. These centers co-ordinate, i.e. harmonize muscular movements.



3. The nerves and organs of sensation may be called the *Sensorium*, the nerves and organs of motion the *Motorium*. The parts of the nervous system and the immediate organs may be grouped thus :



4. As has been said, the mind, acting through the cerebrum, may control all the voluntary movements of the body. The action for instance of the heart and the stomach is involuntary, since it is controlled by

lower nerve centers. Many habitual movements, as walking, may be intrusted to the control of lower nerve centers. **Many messages from vital and sensor organs are answered by lower nerve centers, and do not reach the mind ; hence there are many physical acts which do not involve mental acts.**

**4. MIND AND BODY** <sup>1</sup> (7). We have learned that the Cerebrum is the seat of *Mind*, and that the whole nervous system is the means of communication between the mind within and the world without. We are prepared to believe, then, that a study of the connection between mind and body will furnish interesting facts and throw light on the problems of Psychology.

We speak of an attitude of attention, an angry gesture, a smile of joy, the frown of displeasure, the paleness of fear, a glance of tenderness, an expression of pain. We may often learn what passes in the mind of another from his outward expression. **Many of our mental acts and states have a natural bodily expression.**

Violent emotions quicken the action of the heart; pleasant emotions give a healthy tone to the vital organs, while painful emotions derange their action and depress the system ; severe and protracted mental labor affects the body unfavorably. The body suffers with the mind. **Mental conditions influence the action of the vital organs and may affect the health of the body.**

When the body is supplied with sufficient food of good quality, when the digestion is healthy and the blood is properly purified by the organs of respiration

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<sup>1</sup> Read Bain, *Mind and Body*, Chap. II; McCosh, *The Motive Powers*, Bk. I, Chap. IV.

and secretion, then the mind tends to act clearly and vigorously. When these conditions are wanting the mind is usually less vigorous. Warmth and cold, rest and fatigue, stimulants, drugs, injury to the brain, affect the mind. In case of physical exhaustion the power of the memory is weakened. The state of the nerves makes one morose or cheerful. One's moral nature may be affected by his physical condition. Insanity is usually attended by abnormal conditions in the substance of the brain. **Mental action is affected by physical conditions.**

Scientific investigation shows that mental acts are accompanied by the expenditure of nervous energy. In the case of intense and prolonged thought the nervous waste is shown by the effect upon the system. The nervous action evidently precedes the mental in the case of sensation, as in hearing and seeing; but doubtless emotion, as when we receive news of some great calamity, and the exercise of the will precede the action of the nerves. **In its connection with the body the action of the mind is accompanied by nervous expenditure.**<sup>1</sup>

Some physiologists conclude that nervous action constitutes mental phenomena, instead of being simply the attendant of such phenomena while the mind is connected with the body. They further conclude that there is nothing distinct from the body called Mind or Soul which thinks and feels. Let us briefly examine this theory. When we speak of weight, extension, gravity, etc., we are obliged to think of something underlying these properties, namely, *matter*. When we

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<sup>1</sup> Sully, p. 3 and p. 9.

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speak of thought, feeling, etc., we are obliged to think of something that thinks and feels, namely, *mind*. We cannot view matter as thinking or feeling; we cannot view mind as possessing weight or extension. One class of phenomena has matter as its basis, the other class has something different as its basis, and we call it mind. If there were not a unit called mind, how could there be unified knowledge of all that the being whom you call *I* thinks and feels and does? Some go so far as to say that, as we see the external world through the eyes, so the mind, through its power of self-knowledge, sees itself and all its activities. Moreover, each person feels that there is an entity called *I* which can think and do, a something distinct from the body. **We conclude that Thought, Emotion, and Will are something different from the nervous conditions that accompany them, and that they are manifestations of an entity called Mind.<sup>1</sup>**

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<sup>1</sup> Dr. Carpenter, the eminent physiologist, says: "The Psychologist may fearlessly throw himself into the deepest waters of speculative inquiry in regard to the relation between our Mind and its Bodily instrument, provided that he trusts to the inherent buoyancy of that great fact of Consciousness, that *we have within us a self-determining Power which we call Will*. And he may even find in the evidence of the intimate relation between Mental Activity and Physical changes in the Brain, the most satisfactory grounds which science can afford for his belief that the phenomena of the Material Universe are the expressions of an Infinite Mind and Will, of which Man's is the finite representative."

Prof. Ladd in his *Physiological Psychology* says: "The subject of all the states of consciousness is a real unit-being, called Mind; which is of non-material nature, and acts and develops according to laws of its own, but is specially correlated with cer-

5. **HABIT**<sup>1</sup> (8). Nothing is better known than the fact that bodily movements become easier by repetition. Learning to walk is a laborious process, but after a time the complex muscular movements used in walking are easily and accurately performed. The gait, attitudes and gestures permitted and practiced in childhood become a part of the child's nature and later are employed unconsciously. The series of movements in the practice of any occupation requiring dexterity, as playing a musical instrument, drawing, etc., become so adjusted as to follow each other with ease and regularity. The theory is that every bodily movement creates a *tendency*, in the structure of the reflex nerve centers, to repeat the same movement or series of movements.

When acquiring bodily skill, the mind is the directive power, and the mind acquires skill in ordering complicated series of movements, and in discriminating the sensations by which the accuracy of the movements is tested—in short, the mind acquires habit. The same fact is observed in all exercise of mental power. Mental images of some object frequently seen or thought of readily recur to the mind; trains of thought once pursued are easily recalled and followed; any indulgence of emotions whether of cheerfulness, sympathy, or moroseness tends to repeat itself, and may grow into habit. **Every mental act be-**

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tain material molecules and masses forming the substance of the Brain."

Read quotations in Hamilton's *Metaphysics*, Lect. IV, p. 52; Lect. IX, pp. 114 and 115.

See Porter, *Introduc.*, Chap. II; Bowne, Part I, Chap. I.

<sup>1</sup> Read Carpenter, Chap. VIII; Porter, §§ 265, 266, 267.

comes tendency, is easier to repeat, and often repeated may grow to be a part of character.

**6. FACTORS IN MENTAL GROWTH (9).** In its nature and functions the mind is essentially the same in all individuals, i.e. every mind knows, feels, and wills. But the variations of mental power and traits are as numerous as the individuals themselves. These variations are due to several causes. It is a matter of common observation that the natural capacity of the mind varies with bodily structure and nervous organism.<sup>1</sup> Inherited tendencies are an important factor in determining the character and growth of the individual. Perhaps every one has characteristics which he can trace to father or mother or grandparents. The nature of one's surroundings is also to be considered. Natural scenery impresses itself on the mind and furnishes much of the material for its activity. The influence of varied and beautiful scenery upon mental growth is very important. The disposition and taste are influenced by home surroundings and the choice of companions. **Bodily organism, hereditary power and tendency, natural surroundings, and social contact, are factors in mental growth.**

These facts are vital in the matter of education. Here is a being having a capacity and tendency with which he is endowed by nature, and having a will

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<sup>1</sup> "Temperament denotes an original quality of the constitution supposed to be due to the predominance of one or more of the vital systems—the respiratory, the circulatory, the nutritive, the nervous, and the muscular, modified also by the conditions and relative proportion of the solids and fluids of the system. There are four *simple* temperaments—the sanguine, the bilious, the lymphatic, and the nervous."

Read Ladd, pp. 575-579.

power to choose or reject external influences. These endowments constitute the Internal Factor. On the other hand the mind grows upon the food furnished it in the way of surroundings, influences, and studies. These constitute the External Factor. Recognizing these facts we shall not fall into the error of supposing that the Individual can be wholly reconstructed upon an improved plan by external influences, or of thinking that education can do but little to form character. A correct view of education must regard both the native endowment of the child and its potency in determining his growth, and the possibilities and limits of external influences.

#### APPLICATIONS.

7. **A SOUND MIND IN A SOUND BODY**<sup>1</sup> (4). The physical system has a certain amount of available energy. This energy is used in the processes of digestion, in bodily exercise, in exercise of the brain, and with children in growth of body and brain. Whenever there is an excessive demand in one direction, there is less energy for the other functions and they as a consequence must suffer. Mental exercise is necessary to the health and growth of the mind, but in childhood excessive drafts from the store of energy for brain activity will harm the body and react upon the mind. Every reasonable parent and educator will avoid making too great demands upon the brain of the growing child.

Herbert Spencer quotes some one as saying that the first requisite to success in life is to be a good animal. We may regard the body as the physical

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<sup>1</sup> Read Spencer, Education, Chap. IV.

basis of mental energy ; hence the kind of body which the child is to use as the instrument of the mind is of prime importance. During the period of childhood complete repair of nervous and muscular waste and, in addition, vigorous growth of body are necessary to a strong constitution.

Throughout life perfect nutrition, pure blood, and a sound nervous system are ideal physical conditions. All the wise laws of health which have been drawn from the accumulated experience of men, if observed, will tend to build and sustain a healthy brain for the use of a vigorous and happy mind. Whoever by neglect or excess decreases the vigor of the body will suffer loss in some of those things which make life desirable. Spencer says, "All breaches of the laws of health are physical sins." A sound mind in a sound body is the ideal of the Psychologist as well as of the Physiologist.<sup>1</sup>

**8. HABIT IN EDUCATION<sup>2</sup> (5).** From what we have learned of the influence of habit upon both Body and Mind we must infer that the formation of habits is no small part of education, and that it is highly necessary that good habits be formed in childhood. If it is difficult to change the handwriting when once

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<sup>1</sup> "*Mens sana in corpore sano* is correct as a pedagogical maxim, but false in the judgment of individual cases; because it is possible, on the one hand, to have a healthy mind in an unhealthy body, and, on the other hand, an unhealthy mind in a healthy body. Nevertheless, to strive after the harmony of soul and body is the material condition of all normal activity."—ROSENKRANZ.

<sup>2</sup> Read Radestock, Chap. VIII; Tate, Part I, Chap. IV, p. 127; Fitch, Chap. IV, p. 102; Rosenkranz, §§ 29-34.



formed, it is no less difficult to eradicate bad habits, or overcome the saving influence of good ones. It is a common saying that character is a bundle of habits. It is not enough to let the child grow without restraint as a spontaneous product of nature—he might yield to some undesirable hereditary tendency or develop the nature of an untrained savage. Training is as necessary as play for the child.

The habits to be cultivated are those which should appear as traits of the grown person. Among bodily habits may be mentioned healthful positions in sitting and standing, graceful bearing, skill in drawing or playing musical instruments, quiet positions, and prompt movements. Skillful, prompt, and vigorous movements may be induced by gymnastics or calisthenics or military drill. The Greeks regarded gymnastics as an important factor in education; Fichte is quoted as calling it a vital part of education.

We may add that from the earliest training of the child habits of regularity are indispensable. At the proper age the child should be taught habits of neatness, order, observation, attention, obedience, self-restraint, regard for the rights of others, kindness, control of emotions, etc. The fact that this training will often prove unpleasant to the child does not detract from its educational value. To form the habit of enduring unpleasant things is an education in itself; this fact was recognized in the Spartan discipline.

Finally, the schoolroom may be the best place for the cultivation of many of the habits mentioned. Healthful positions, punctuality, promptness, silence, restraint of inclination, though matters of tiresome daily routine, have a profound educational value. The

growth of habit is slow, but teacher and pupil may be encouraged by the fact that every act performed to-day will be easier to-morrow. With children, the use of rules and precepts is of little value unless the things to be acquired are constantly practiced until they become habit. Habit makes irksome tasks easy and the performance of duty a pleasure. The methods of every schoolroom are forming habits in children and youth which will affect their entire life.<sup>1</sup>

**9. INFLUENCES. NATURAL GROWTH (6).** Among the factors in mental growth was mentioned the nature of one's surroundings. Childhood is the period of imitation; hence the companionship, the sights, the beliefs that the child daily encounters are to be regarded as a potent factor in his education. Parent and teacher should guard carefully the approach of external influences, and strive to surround the child with a healthful atmosphere. There is a class of unfortunate children in large cities who are reared in ignorance, vice and uselessness; the responsibility for this rests upon the state and society. Provision should be made to give them at least the rudiments of a sound education and the knowledge of some useful occupation. Children of the class mentioned, when placed in school, require the exercise of patience and hopeful persistence; only by these means may the teacher hope to counteract acquired habits and educate the better tendencies of their nature.

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<sup>1</sup> "Child-life without the formation of habits is impossible. Not to form good habits is to make slovenliness, disorder, inattention, disobedience, subserviency to passion, cruelty, and the shirking of everything unpleasant habitual."

Our view of the mind as a *self-activity* suggests that as a rule cramming and forcing processes should not be employed. The plant or the human body increases in size and strength when appropriate nutriment is supplied in sufficient, not excessive, quantity. Note that the process is a growth and development. When educating the mind, we discover a useful analogy in the growth of the plant. The teacher has done his best work when he has supplied appropriate material and furnished the most favorable conditions for the natural development of the pupil. Individual differences and aptitudes in children must often be considered. This fact points to a degree of flexibility in the employment of means and methods.

#### **EXERCISES.**

1. What is a Subjective Science? An Objective Science?
2. Mention any states and acts of your own mind. Define Introspection; Physical Phenomena; Mental Phenomena.
3. Why is the study of the child's mind of special value to the Psychologist and the Educator?
4. How may literature aid in the study of the human mind? Give some illustrations.
5. Illustrate your idea of a nerve center and of reflex action by use of a diagram.
6. In Fig. 8 trace the course of an "optic impression," resulting in movement of the body toward the object seen.
7. When the cerebrum is removed from the brain of a frog, what power of movement remains? Are these movements intelligent?
8. May walking be controlled by pure reflex action?
9. Give some examples of bodily expression of mental states.
10. Give some examples of the influence of body upon mind.
11. Give some examples of mental habit.
12. Does gymnastics train the mind?

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13. Make some statements about the effect of natural scenery on mental growth.

14. Give some illustrations of the influence of social surroundings on character.

15. Is the character of an individual due more to his nature than to his education ?

16. Should the discipline of a school require anything that has not an educational value ? Mention some requirement which in your opinion has no value.

17. Give reasons for the belief that education is a process of growth and development. What is the difference between growth and development ?

## CONSCIOUSNESS AND ATTENTION. MENTAL ACTIVITIES.

**10. CONSCIOUSNESS.** Knowledge of their own existence, or action, cannot be ascribed to matter or the "blind" forces of Nature. The mountain stands in grandeur, but knows not its existence; the tree sways in the wind, but heeds not the movement; the plant blossoms, but sees not its beauty. Mind is peculiar in that it not only acts but knows that it acts; it not only knows, feels, and wills, but knows that it knows, feels, and wills. Consciousness is the term applied to this distinguishing characteristic of Mind. It is sometimes called poetically *inner illumination* or the *eye of the mind*. Without consciousness, the inner world would be as it were not; and the outer world with its infinity of combination, form, and color, but a "darkling blank." **Consciousness is the power of the Mind by which it knows its own acts and states.**

The mind is directly conscious of what goes on within it,—impressions from the external world, thoughts, feelings, and volitions. The mind is conscious only of what is present. Last night I viewed a phosphorescent sea and consciously admired the waves breaking in long lines of white fire. To-day I remember the experience, but am conscious only of the remembrance. I had imagined it before, but was conscious only of the

imagination. Is the mind conscious of more than its acts? I see the rose. The mind is conscious of the perception; is it also conscious of the I, i.e., the mind, and of the object perceived, the rose? Many writers, one of whom is quoted, say Yes. "The object known, the subject knowing, and the knowledge are known simultaneously in one and the same act. . . . The mind is like the sun, which in revealing external objects necessarily reveals itself." Many thinkers, on the contrary, believe that the mental act is the only object of consciousness, and that the knowledge of the *ego* and of the external object is merely an inference or a necessary belief.<sup>1</sup>

Is there unconscious mental activity? <sup>\*</sup> The following are facts of common or well-authenticated experience: a name which eludes us at a particular moment may come to us after the mind is turned to other subjects; a thought frequently suggests a remote idea when we are unconscious of the intervening links; a happy solution of a perplexing question sometimes suggests itself if the whole matter be discharged from the consciousness; all persons experience at times what may be called unexpected flashes of knowledge; a topic which is mixed and troublesome at night may be perfectly clear in the morning; after an interval of rest from a subject, it often seems to have grown in the mind; the mind in sleep is able to carry a purpose to awake at a certain hour; we are subject to uncon-

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<sup>1</sup> See Porter, §§ 81, 82, 83.

<sup>\*</sup> Unconscious Mental Action is also called "Latent Consciousness" and "Unconscious Cerebration." The term Unconscious Cerebration is employed by some Physiologists because they explain unconscious activity as "reflex action of the brain."

cious prejudice. From these and kindred facts many writers infer that there is unconscious mental activity.<sup>1</sup>

**11. ATTENTION DEFINED.**<sup>2</sup> Put yourself in an attitude of attention; the senses are alert, the mind is expectant. You select a particular object or thought to the exclusion of others and fix the mind upon it. If the object be of interest you prolong your effort; after a time you turn the mind to some other object. Of the multitude of impressions from the external world, and of the varied thoughts and images of the mental world, the mind has the power to select and fix upon certain ones. Here the mind is conscious of effort at self-direction and the act is called voluntary.

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<sup>1</sup> There are degrees of consciousness. Doubtless we are dimly conscious at the time of many mental acts which we afterwards fail to remember. A person reading a book may be earnestly attentive to the thought of the author, and at the same time have a faint consciousness of various bodily sensations, of sounds, fragments of memory, or bits of fancy. By attention any one of these may rise into the region of clear consciousness. This phase of the question should not be confounded with the one under discussion.

Sir William Hamilton says touching this question: "I do not hesitate to maintain that what we are conscious of is constructed out of what we are not conscious of."

Dr. McCosh says: "I believe it [any unconscious phenomenon] can all be explained by the ordinary laws of mind, without our calling in such an anomalous principle as unconscious mental action. I hold that we are conscious of the acts at the time, but that they were not retained, as there was nothing to fix them in memory."

For discussion and examples see Hamilton, *Lects.* XVIII, XIX; Carpenter, *Chap.* XIII; Porter, § 87.

<sup>2</sup> On the whole subject of Attention, read Sully, *Chap.* IV; Carpenter, *Chap.* III; Hamilton, *Lect.* XIV.

Voluntary attention is the active self-direction of the mind toward any object external or internal. Since attention makes consciousness more vivid it is sometimes called "Voluntary Consciousness."

Attention is often spontaneous. Objects of interest *attract* the mind. Children use but little will power in attention, but the mind turns to whatever is attractive. We are often startled into an attitude of attention by some unexpected occurrence. In these instances the consciously active Will is either wanting or is used in only a slight degree, hence such phases of attention are called *Non-Voluntary*.

**12. STIMULUS OF ATTENTION (16).** In order to attend, some object either internal or external must be presented to the mind. This object may be called the excitant or *stimulus*. A stimulus may be attractiveness in some external object or phenomenon, as the beauty of a strange flower, or the flash of a storm-cloud; it may be something striking in an idea; it may be a motive arising in the mind, as a desire to learn. Many objects both external and mental solicit the attention at the same time, but some in a higher degree than others. The principles of attention in response to a stimulus may be learned by observation. (1) Sweet music, beautiful scenes or pictures, activities in which we delight, objects of pleasing anticipation,—in short whatever is capable of producing agreeable emotions arouses attention. The same is true of whatever occasions painful emotion. (2) A bright object, a loud sound, a vivid mental image, a great enterprise, strongly solicit the attention. Hence the amount of attention answers to the degree of stimulus. (3) A child is pleased with the variety of his play-



things; adults are constantly searching for variety in surroundings and amusements; the curiosity is aroused by what is new. We infer that variety and novelty are especially promotive of attention. (4) One boy is aroused by sports, another by reference to books; the connoisseur in art is attracted by a fine painting, the merchant by a quotation of market values. So one's tendencies help to direct his attention.

1. Whatever occasions strong emotions of pleasure or pain claims the attention.

2. The degree of attention varies with the intensity of the stimulus.

3. Variety and novelty excite the attention.

4. Attention is more likely to be aroused if the object accords with one's habits, tastes, and tendencies.

### **13. CONDITIONS UNFAVORABLE TO ATTENTION (17).**

When an attractive object is present to the mind it will not receive full attention unless the conditions are favorable. It is important to know the conditions unfavorable to attention. (1) The repetition of any sound, as the ticking of a clock, the noises of a city, finally fails to attract notice, and the repetition of a thought after a while fails to interest. (2) Time is required to adjust the mind to a new train of thought, and confusion results from presenting several disconnected ideas at the same time. Hence a speaker when about to present a new subject gradually prepares the mind. (3) Prolonged attention wearies. (4) When exciting or annoying events occur, it is almost impossible to fix the attention upon a given subject; physical pain distracts the attention. (5) The connection between mind and body is such

that the mind must suffer with the body ; hence, when the body is wearied, the mind is not in condition for vigorous effort.

Conditions unfavorable to attention may be enumerated as follows: (1) Too frequent repetition. (2) Too rapid or abrupt transition from one object to another. (3) Weariness from prolonged effort. (4) Disturbing external influences and mental agitation. (5) Ill health or physical weariness.

**14. GROWTH AND POWER OF ATTENTION** (16, 18). Observe the activities of children. Now a musical sound, next some bright object, then a new toy draws their attention. The attention of a young child is a response to some outer stimulus. External objects affect the senses, especially of sight and touch, and by a kind of reflex action, the attention is directed hither and thither according to the degree of attractiveness in the object. Activity in children is constant, and the attention is ready to seize upon any object presented ; their early life is thus a continual exercise of this power.

Voluntary attention is employed when the child has acquired some experience and is able to use a degree of foresight. Now motives are first employed, and the attention will be given to a task to escape punishment, to merit approbation, or to gain knowledge. During this period voluntary attention is weak and easily turned from its object. Many things solicit at the same time, and diverting influences may nearly or quite offset the voluntary power. At this period of growth the influence and guidance of parents and teacher are needed to aid the efforts of the child. But every exercise of the power tends to form habit, requiring less effort of will. A high training of the

faculty will finally enable the mind to exclude all other influences and direct itself to a given object of thought. It is thus possible for the interest in a subject to become an absorbing one, and, if the motives employed be of a high character, as sense of duty or desire for excellence, the mind may be led to the highest and best attainments.

People who cannot give close and continued attention learn slowly and imperfectly. Many students do not use half their power for acquisition and growth, and never in later years reach any satisfactory attainment. Memory depends upon attention. One may listlessly peruse the pages of a book and remember nothing, because he fully attended to none of the thoughts. Attention is the die that stamps a deep impression on the memory.

The attention may be trained to grasp a large field, as when a teacher observes a school, to pass rapidly from one subject to another, or to engage in concentrated and prolonged effort. This last is the highest exercise of the power, and it constitutes a most important element of genius. Newton said that, if he had made any discoveries, it was owing more to patient attention than to any other talent. Very many instances might be cited of the wonderful development of this power, and the great results to which it led. Certain it is that all acquirement of knowledge, all success in professional or business life, all growth and development of faculty depend upon the power of attention.<sup>1</sup>

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<sup>1</sup> Read Hamilton, Lect. XIV.

“The one serviceable, safe, certain, remunerative, attainable quality, in every study and in every pursuit, is the quality of

**15. KINDS OF MENTAL ACTIVITY** (19). If we turn the attention to our mental activities at any moment, we are likely to find them varied and complex. For the purpose of study it is necessary to arrange in groups mental acts that are similar, assigning a name to each group. In each day's experience our minds are employed in perceiving, recalling and reasoning, in gaining *knowledge* of the world, and what is going on in it; the mind is also the subject of sensations, as from sight and hearing, and constantly experiences *feelings* of pain or pleasure; we are conscious, also, of impulses and decisions to do something which shall yield us profit or pleasure, or may fall within the line of duty; in other words, we choose or *will*. **Knowing, Feeling, and Willing are the three kinds of mental activity.** Vary the experiment as we may, all our mental experiences will fall within one of these groups.

Since we observe different kinds of mental activity, it is natural to think of powers or faculties of the mind as giving rise to these activities. Our knowledge, feeling, and choice are thus referred to three faculties: *The Intellect, The Sensibility, and The Will*. But properly the mind is to be regarded as a unit, with power to act in different ways. For convenience

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**ATTENTION.** My own invention or imagination, such as it is, I can most truthfully assure you, would never have served me as it has, but for the habit of commonplace, humble, patient, daily, toiling, drudging attention. Genius, vivacity, quickness of penetration, brilliancy in association of ideas,—such mental qualities will not be commanded; but attention, after a due term of submissive service, always will. Like certain plants which the poorest peasant may grow in the poorest soil, it can be cultivated by any one, and it is certain, in its own good season, to bring forth flowers and fruit.”—DICKENS.

it may be said to have as many faculties as it has distinct modes of activity.

There is a certain relation between the three mental powers named and a certain logical order in their working. This order and relation may be determined by experiment. A friend invites my attention to an instructive and inspiring novel; he awakens my desire to know more of it; I decide to purchase and read this new publication, and carry my decision into effect. Here the *knowledge* of the new volume precedes the *feeling* of anticipated pleasure and of desire, and leads to the feeling; the feeling precedes and leads to the exertion of the *will*. If we apply a test to any of our deliberate acts, we shall discover the same order and relation. **The natural order in mental activity both in point of time and dependence is Knowing, Feeling, Willing.** In this order the activities or faculties will be treated.<sup>1</sup>

#### APPLICATIONS.

**16. ATTENTION IN EARLY YEARS. APPROPRIATE STIMULUS'** (12, 14). Much of the work of the teacher of young children is to furnish the proper stimulus to attention. Most children are full of activity and simply need guidance. If we examine the four principles under "Stimulus of Attention," we shall find that those things which tend to claim the attention are in-

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<sup>1</sup> There are some exceptions to this order. Such are "Sensation," and perhaps the relation between emotion and judgment in view of the Beautiful and the Right; but it is not necessary to discuss these exceptions here.

<sup>2</sup> Upon this and the two following topics read Bain, Education, Chap. III, CONCENTRATION, and Chap. VI; Tate, Part II, Chap. III; Richter, Seventh Fragment, Chap. III.

teresting. For the young child, then, tasks should, if possible, be made agreeable; his first motive is pleasure. Bain, in his "Education as a Science," claims that a touch of pain is not unfavorable to attention, but adds, "If the work is within the compass of the pupils' faculties, and if a fair amount of assistance is rendered in the way of intelligible direction, although some sort of pain will frequently be necessary, it ought not to be so great as to damp the spirits or waste the plastic energy." The use of blame or pain of any kind is not in itself economical, for it wastes the nervous energy, and leaves less for the self-direction of the mind. It is to be employed only when other methods fail. All experience shows that extreme emotion, whether of pleasure or pain, is not favorable to attention, but that a state of "moderate exhilaration and cheerfulness" is most favorable.

It is hardly necessary to add that object-lessons are adapted to the child's mind, and that they must be sufficiently attractive to offset for the time other influences; that the attention of the child cannot profitably be held long to one subject, and that his mind delights in variety and novelty; that in case one stimulus fails another may be employed with reference to his tastes and tendencies.

**17. DIFFICULTIES IN THE WAY OF ATTENTION (13).** Tate in his "Philosophy of Education" says: "*The Boy of Feeble Intellect* is inattentive because of his incapacity; *The Sluggish, Lazy Boy* is inattentive from a want of all mental activity; *The Volatile Boy* is inattentive from his love of novelty; *The Timid Boy* is inattentive for want of sufficient confidence in his own powers; *The Boy of Genius* is not inattentive in the

ordinary acceptation of the word ; to a common observer he appears dull, but it is the dullness of inward thought." This summary suggests some of the difficulties in the path of the instructor, together with the necessity of knowing the different types of character, and adapting to some degree the means to the end. The dull boy needs more stimulus than any other of the classes mentioned, and it is wrong to blame him for what he cannot help.

Some of the common causes of failure to secure attention are attempting too many things at a time, requiring tasks beyond the power or comprehension of the pupil, and requiring too prolonged effort of his power. Disturbing influences should be removed from the schoolroom.

In every case when appropriate stimulus fails, the will of the teacher must act as a gentle and firm power urging to the performance of tasks. Enforced attention is better than no attention, and the pupil should not be permitted to act to his own harm, because it would not be agreeable to him to give his thoughts to the task in hand. Even compulsory performance of duty tends to form the habit, and the habit may grow into permanent character.

**18. IMPORTANCE OF ATTENTION. MOTIVES (14).** All education depends upon attention. Without the power to secure it, the teacher will fail of success, and without it the pupil will fall short of reasonable attainments. Inattention should never be permitted in the class-room ; attention must be secured at any cost.<sup>1</sup> But it cannot be too forcibly impressed that the true

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<sup>1</sup> Read Rosenkranz, § 83.

cultivation of the power consists in its voluntary exercise. The pupil must do for himself, must feel the pleasure of discovery, and grow into a love of the pursuit of knowledge.

After all that has been said about finding an appropriate stimulus, and making tasks agreeable, the plain truth must finally be faced, that disagreeable tasks must be accomplished by pure effort of will. Bain says: "Then comes the stern conclusion that the *uninteresting* must be faced at last, that by no palliation or device are we able to make agreeable everything that has to be mastered. The age of drudgery must commence, every motive that can avert it is in the end exhausted."<sup>1</sup>

With older pupils motives must be employed as incentives to vigorous application. The common motives employed, stated in the order of their intrinsic value, are the fear of pain, the love of praise, the hope of future good, the desire for excellence, the motive of duty.<sup>2</sup> The building of sound character requires that the higher and better of these motives be used successfully, and become permanent incentives to action.

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<sup>1</sup> Rosenkranz emphasizes the thought that work must be sharply distinguished from play. "Work should never be treated as if it were play, nor play as if it were work."

"Without play, the child would become more and more a machine, and lose all freshness and spontaneity—all originality. Without work, he would develop into a monster of caprice and arbitrariness."

<sup>2</sup> Dr. White selects these seven as the natural incentives most used in school: (1) A desire for standing or rank, including the desire to excel. (2) A desire for approbation—of equals and



**19. RELATION OF PSYCHOLOGY TO EDUCATION (15).**

“ On earth, there is nothing great but man ;  
In man there is nothing great but mind.”

Psychology is the science of mind ; it treats of mental activities, traces their growth from the germ to their highest exercise, and considers the laws of their development. The importance of studying the manifold phenomena of the human consciousness is not likely to be overestimated. This study not only reveals the wonders of the mental world, but it may have much practical value, especially as a basis of educational principles. To acquire knowledge of the world without us, and of the powers and possibilities of the inner or mental world, to cultivate the emotions upon which the happiness or misery of man depends, to strengthen will power which is to guide the individual in his growth and in his relations to society, constitute the essential part of education. Psychology enables the teacher to direct understandingly the early growth of the mental powers ; it aids the individual in striving for that which is highest and best in himself, it is of value to all who would influence their fellow-men toward moral excellence and the best use of their faculties.

**EXERCISES.**

1. Give any reasons of your own to prove that there is unconscious mental activity.
  2. How may many bodily movements be explained as not due to mental activity either conscious or unconscious ?
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superiors. (3) A desire for activity and power. (4) A desire for knowledge. (5) The hope of future good. (6) A sense of honor. (7) A sense of duty.

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3. Consciousness of self is sometimes abnormal or morbid. Give examples of abnormal consciousness.

4. Imagine a world void of consciousness.

5. Analyze an act of Attention.

6. Illustrate the difference between Voluntary and Non-Voluntary Attention.

7. Illustrate the difference between "inner" and "outer" attention.

8. Can we attend to more than one thing at the same time?

9. What may constitute an object of attention?

10. Illustrate in your own way each of the principles of "Stimulus of Attention."

11. Show that variety and change are necessary for the adult as well as for the child.

12. Make practical applications of each of the unfavorable conditions of attention.

13. Illustrate the meaning of "attention of wide grasp"; "varied attention"; "prolonged attention." Imagine a person with no power of attention.

14. Give an original illustration of the relation between the three faculties of the mind.

15. Give some examples of great power of attention.

16. Give the philosophy of the employment of pain as a motive to action.

17. Make a list of common motives arranged in the order of their value, also in the order of their success as incentives to action.

18. Mention any violation of the principles of attention in your own methods of study.

19. State specifically any practical uses of psychology.

20. Form a definition of Education.

## KNOWING—THE INTELLECT.

### PRESENTATION—PERCEPTION.

**20. KINDS OF INTELLECTUAL ACTIVITY (30).** We have learned that there are three distinct modes of mental activity,—Knowing, Feeling, and Willing. There are various modes of Knowing which have received appropriate names. Through the senses we *perceive* the External World and gain a knowledge of the objects which *present* themselves. These same objects, known in childhood, in after years may be *re-presented* in *Memory*. We may *think* about the events of a day, or the experience of former years, and draw conclusions which were not reached through perception or memory. When we perceive objects we *gain a knowledge* of them ; when we remember we *re-present a knowledge* of them ; when we think about them so as to form judgments or reach conclusions we *add to the knowledge* acquired by perception. These statements show the aptness of the terms employed, and suggest in part the following classification :

Processes of Knowing	{ Presentation (Perception).	
	Representation	{ Memory, Phantasy, Imagination.
	Thinking	{ Conception, Judgment, Reasoning.

The mind is first awakened by communication with the External World through the senses. Perception of external objects is the first Intellectual Activity,<sup>1</sup> and it furnishes the material for the exercise of Memory and Reason; hence the study of this faculty naturally precedes that of the other powers of the Intellect.

**21. SENSATION.** There are two classes of sensations,—*General* and *Special*.

**General Sensations** include all those which do not belong to the “five senses,”—those which constitute our bodily comfort or discomfort; they may be classed as follows:

*Muscular Sensations* of injury, fatigue, and repose.

*Nervous Sensations* arising from the state of the nervous system, as when we feel the exhilaration of perfect health or are weakened by care or suffering.

*Vital Sensations*, depending on the condition of the vital organs, as those of hunger and thirst and their opposites, the pain of indigestion, the feeling of suffocation when breathing impure air.<sup>2</sup>

**Special Sensations** are of five kinds, namely, those of *Touch* (including those of the “*Muscular Sense*”), of *Sight*, of *Hearing*, of *Taste*, and of *Smell*.

The senses of Sight and Hearing are furnished with extremely delicate organs; the nerves of Taste and Smell are distributed to the upper surface of the tongue and to the membrane lining the nose. All the nerves of sensation center in the brain and thus com-

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<sup>1</sup> This is practically true, though we may grant that the first mental experience is consciousness of bodily sensations.

<sup>2</sup> Bain, Bk. I, Chap. II.

municate with the mind, reporting conditions of the body and impressions from the external world.<sup>1</sup>

The conditions of sensation are that the organs of sensation be sound, and that some excitant give rise to molecular vibration of the nerves; this vibration is communicated to the brain, there producing the mental product of sensation. The excitant of the optic nerve is the vibration of the ether, a wave motion emanating from some luminous body and striking the delicate organism of the eye. The sense of hearing is aroused by vibrations of the air or some other elastic medium. The sensations of temperature are due to vibrations of ether, or to the heat vibrations of some conducting substance, which strike the nerves distributed to the parts of the body. It is supposed that the sensations of touch, taste, and smell are the result of molecular movement in the nerve substance.<sup>2</sup>

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<sup>1</sup> Experiments have been made to ascertain the discriminating power of the senses. It has been found that the mind, through sensation, can recognize a variation in temperature of about 1° F. If the points of a pair of compasses be applied to the surface of the body, the points must be at a certain distance apart to give a sense of "double contact." The smallest distance varies on different parts of the body from the thirty-sixth of an inch to three inches. The tip of the tongue is most sensitive in recognizing double contact. Laying the hand and forearm on a table, the mind may discriminate between a pressure of 20 oz. and 19.2 oz. laid on the tips of the fingers, and between 20 oz. and 18.7 laid on the forearm. Fechner's experiments showed, among other things, that in lifting a small weight (300 grams) a difference of one twenty-fifth could be recognized.

For extended results refer to Ladd's *Physiological Psychology*, pp. 367-369.

<sup>2</sup> A modified view is thus expressed by Prof. Ladd: "On gen-

**22. PERCEPTION EXPLAINED AND DEFINED.<sup>1</sup>** We locate visual objects at various distances from the body, but persons born blind, who have afterward received sight, at first see the external world as a confused patchwork of color touching the eye or indefinitely located; they do not distinguish one object from another by sight, and do not know the shape of anything. Originally the sensation of color is not connected with the idea of distance and place, for the sensation is in the mind. It is through experience that we come to use the sensation as a sign of external existence, and acquire the power to correctly locate the cause of the sensation. If we could revive the experience of infancy and make it a vividly conscious experience, we should learn that the External World—familiar objects, human beings, the landscape, the sky, strains of beautiful music, the sound of the distant bell, our own bodies—at first impressed our minds only as sensations, and that the sensations, by a slow process of experience, were interpreted as marks of external qualities.

The mind of the child is at first without knowledge or consciousness; its first experience is probably of sensations of bodily comfort or discomfort, together with a feeble response to light and sound the sources of which are not located.<sup>2</sup> It is difficult for us to

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eral principles of physical science there can be little doubt that the excitation and conduction of nerve-commotion is dependent upon a chemical change in the nervous tissue itself." See further, Ladd, p. 222.

<sup>1</sup> Read Hamilton, Lect. XXIV; Sully, pp. 147-149; Taine, Part II, Bk. II, Chap. II.

<sup>2</sup> Taine notes the following observations in case of a little girl:

think of pure sensation, because we have learned by experience to associate every sensation with our acquired knowledge. We experience something like pure sensation when startled by a sudden and unknown sound, when surprised by a flash of light from an unknown source, or when perplexed by the odor of a strange flower of whose presence we were ignorant; yet in these cases we cannot rid ourselves of the idea that the causes of the sensations are external.

It is a common error to mistake sensation for per-

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"It is certain to my mind that during the first two months, the surrounding world was composed for her of sounds and patches of color, which she did not know how to situate. At two months and a half, she evidently recognized the direction of certain sounds: for instance, hearing her grandmother's voice, she turned her head toward her. At three months she knew, in some cases, how to direct her looks by turning her head and eyes toward the object she wished to see. . . . At about three months old she commenced to feel about with her hands, to move her arms to reach objects, consequently, to associate with the colored patches tactile and muscular impressions of distance and form."

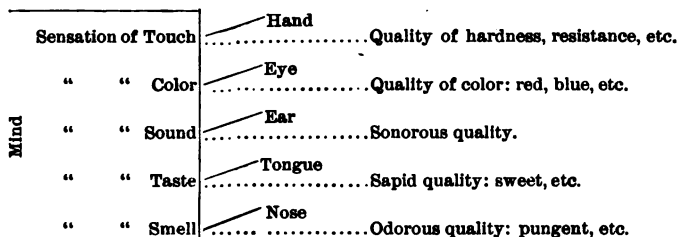
The following beautiful stanzas from Tennyson are often quoted in this connection:

- " The baby, new to earth and sky,  
What time his tender palm is pressed  
Against the circle of the breast,  
Has never thought that this is I.
- " But as he grows, he gathers much,  
And learns the use of I and me,  
And finds I am not what I see,  
And other than the things I touch;
- " So rounds he to a separate mind,  
From whence clear memory may begin,  
As thro' the frame that binds him in,  
His isolation grows defined."

ception. Mere feeling is not knowledge. Sensations are neither the qualities of matter nor the knowledge of those qualities. They are simply the means by which objects are revealed. Sensation may be regarded as the point of contact between Mind and the External World. We perceive when through sensation we are made to know the existence of external objects.

Perception is the act of gaining knowledge of the external world through the senses.

The statements of this section and of the preceding one may be made clearer by a diagram :



The hand touches some external object, a wave moves along the nerves of touch and produces a sensation in the mind; this sensation is at once referred by the mind to the object producing the sensation and regarded as a quality of the object. Light flashes to the eye, trembles along the optic nerve, produces a sensation, and reveals the hue of the sunset sky. A trill strikes the delicate auditory mechanism and we recognize the song of a bird. Volatile elements from the garden disturb the olfactory nerve, and we enjoy the sweet odor of flowers. Through the five senses the world of infinite variety, form, and color stands revealed to us in all its beauty and wonder.



**23. GROWTH OF PERCEPTION : TACTILE AND MUSCULAR MAP.** The first work of the child in perception is to map out, in the mind, the different parts of the body, and to locate therein the causes of his sensations; he then makes a map of the world external to the body so far as objects may be known by touch. These maps are formed by interpreting muscular and tactile sensations, which are messages, as it were, from the material world.<sup>1</sup>

Move the arm and note the muscular sensations, then touch some object and note the tactile sensation. By contrast between the muscular and the tactile sensations the surface of the body is gradually outlined and limited. Now note the contrast when one hand touches the other, and when the hand touches some external object; the one sensation is called *double*, the other *single*. By contrast between the double and the single sensation, the distinction between Body and Not-Body is learned. Move the arm through a short distance, then through a longer, now in one direction, then in another, and note the varying sensations. It is through muscular sensation that the idea of distance is gradually acquired. Observe the difference between merely touching a body and grasping it. When grasping an object we are conscious of the bent position of the fingers and the continuity of touch.<sup>2</sup> Finally, touch a variety of objects and note the varying sensations of hardness, smoothness, etc.

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<sup>1</sup> Some psychologists claim that a knowledge of the body as external to the mind, extended and having parts, is revealed by every action of each of the senses. See Porter, §§ 114 and 119.

<sup>2</sup> Read Porter, §§ 142-149 and 153-156.

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Through tactile and muscular sensations—

- (1) We know the externality of the body to the mind;
- (2) We learn the distinction between Body and Not-Body;
- (3) We acquire ideas of distance, form, size, resistance;
- (4) We discover the qualities of hardness, smoothness, etc.<sup>1</sup>

24. **GROWTH OF PERCEPTION: 'VISUAL MAP' (31).** We are next to learn how we construct in the mind a visual map of the external world, and locate upon this map in signs of vision the information gained through the tactile and the muscular sense.<sup>2</sup>

The sense of sight probably gives originally only sensations of color.<sup>3</sup> How do we learn to locate colored objects in space? Note the movements of the child, how the eye constantly follows bright objects, how the hand attempts to reach them, how the eye follows the hand. When a colored object is thus touched, we may suppose that the knowledge of the hand is shared by the eye, and that the idea of position through the sense of vision arises. (1) If we hold the eyes fixed upon a given point, we note that the

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<sup>1</sup> Bain says, p. 50: "There is nothing essential to the highest intellectual processes of science and thought that may not be attained in the absence of sight. The integrity of the moving apparatus of the frame renders it possible to acquire the fundamental notions of space, magnitude, figure, force, and movement, and through these to comprehend the great leading facts of creation, as taught in mathematical, mechanical, or physical science."

<sup>2</sup> Taine, Part II, Book II, Chap. II, § IV.

<sup>3</sup> Read Porter, §§ 133-135. Carpenter says: "Sight originally informs only of what can be presented in a picture—that is, light and shade and color."

impression is more distinct in the direct line of vision, and that toward the outer circle of objects in the field of vision it grows less distinct. (2) The size and the distance of objects determine the size of the image on the retina. (3) We are conscious of muscular effort in turning the eyes toward an object, in keeping the eyes upon an object as it gradually approaches or recedes, and in tracing the dimensions of an object. Try the experiments suggested; you will then be prepared for the following inference: **Through the varying impressions—due (1) to the position of the image on the retina, (2) to the size of the image, and (3) to the muscular efforts in directing the eyes, we locate objects, determine their size, and their condition of movement or rest. Bodies are thus located to the right or the left, above or below, far or near. Movement across the field of vision is known by the effort in turning the eyes. Objects distinctly seen are known to be near, indistinctness is associated with distance. The nearness of small objects is known by the muscular effort in directing both eyes to the same point. The distance of known objects, and the size of unknown objects at a known distance, are determined by the visual angle.**<sup>1</sup> Remember that color alone is learned by sight. All this other knowledge, this visual map of the external world, is first taught by touch and the muscular sense, by the various hand and arm movements, and by the muscular efforts made in moving different distances to and from objects.<sup>2</sup>

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<sup>1</sup> Refer to some work on Physics. Let each experiment for himself, note the varying sensations, and verify the above facts.

<sup>2</sup> Read Porter, §§ 140-142, 156-161; Bain, Book I, Chap. II, "Sense of Sight"; Ladd, p. 420.

By sight we learn also to distinguish one object from another, and to identify objects known to the touch.<sup>1</sup> Every surface appears colored.<sup>2</sup> Many familiar objects possess a characteristic color which we associate with our tactual knowledge of them. Every kind of surface, as rough or smooth, has its own color or luster. A solid body presents a variety of shading as the portion of surface is nearer or more remote, this shading varying with the shape of the solid. We may learn to recognize objects known to the touch by association of color, luster, shading, etc.<sup>3</sup>

**25. GROWTH OF PERCEPTION: HEARING, TASTE, AND SMELL.** Sounds are originally sensations within the mind. After long experience the child associates sounds with the cause, if the cause be some object familiar to touch and sight. We judge of the distance of a familiar sound by its degree of distinctness. The direction of a sound may be imperfectly determined by the different effect upon the two organs of hearing.

An article of food may be recognized by taste alone, if we place it in the mouth without seeing it or recognizing it by touch. This is often done by children in their play, when some sweetmeat is offered with the

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<sup>1</sup> The "confused surface of color" which the aggregate of objects in the field of vision originally presents to the eye gradually becomes separated by experience into distinct objects of vision.

<sup>2</sup> Light and shade are here included under color.

<sup>3</sup> A youth for whom Dr. Cheselden removed a cataract could easily recognize the household dog and cat by feeling, but at first could not, by sight, tell which was the cat and which the dog. One day he was seen to take the cat and stroke her carefully while looking at her attentively. He then put her down, saying, "So, puss, I shall know you another time."

request, "Shut your eyes and open your mouth." We gain no original knowledge of bodies by taste; the image of the object which a familiar taste calls up has been acquired through the other senses.

Odors are associated, for instance, with the sight of familiar flowers, because we have observed the presence of the flowers when inhaling the fragrance.<sup>1</sup> If smell were our only sense, the entire work of Perception would be the apprehension and discrimination of sensations of smell.

**26. PERCEPT, IMAGE.** We have considered separately the knowledge received through each sense. Let us review the work of each sense in revealing the qualities of some familiar object, as an apple. The sense of touch reveals its size, smoothness, etc.; the sense of sight reveals its color; the taste, odor, and dull sonorous quality are known through the senses of taste, smell, and hearing. We group all these separate qualities at the same time in one place. We need not employ all the senses to recognize this familiar fruit, sight alone tells us what it is; but the qualities originally revealed by the other senses are revived by the memory and associated with the well-known color and shape. The impression made upon the mind through one or more senses by a present object, together with revived impressions of the other senses, is called a **PERCEPT**.<sup>2</sup>

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<sup>1</sup> "The direction and nature of the object which causes the sensations are judged by variations of intensity on turning the head, or on approaching or receding from the object."—PROF. LADD.

<sup>2</sup> Compare Porter, §§ 161, 162. Porter applies the term Percept to the knowledge of an object gained through a single sense. The various percepts are fused into a single notion of the object as a whole.

A Percept revived by an act of memory is called an **IMAGE**.<sup>1</sup> I perceive this apple lying on the table—the mental product, the impression made upon the mind, as I view it is a Percept; I remember the appearance of a fine large apple as it hung on a branch in the garden—this is an Image.

**27. ELEMENTS OF PERCEPTION.** I experience an auditory sensation, a stroke of full volume vanishing in a hollow murmur; I intuitively believe that the sensation is due to some external cause; from my previous acquaintance with like sensations I infer the cause to be the vibration of the distant church-bell; I construct a full mental picture of the bell as known through the different senses. The elements of perception are—(1) Sensation; (2) Intuition; (3) Inference; (4) Grouping or Construction. In our experience these elements play their part so rapidly that we are often conscious of only the product, the finished percept; but a careful analysis of any act of perception will reveal the existence of each of the four elements.

**28. NECESSARY IDEAS.** During the growth of Perception certain ideas arise which are not perceived through the senses; they spring from the mind's own energy. These ideas do not exist clearly in the mind in early years, but they are gradually defined by experience. Whenever I perceive I am not only conscious of the mental product, the Percept, but I intuitively know myself as existing and perceiving, and the existence of an object perceived. Hence arises the idea of **Being**.<sup>2</sup> Whenever I experience sensation,

<sup>1</sup> Compare Sully, p. 224. *Idea* is sometimes used in the sense of Image.

<sup>2</sup> The development of the idea of self is well illustrated by this quotation from Jean Paul Richter, used by Dr. Porter: "Never

I intuitively ascribe the sensation to an external **Cause**. Objects cannot exist without existing somewhere, that is in space. The notion of **Space** is another necessary idea. We cannot perceive objects in succession without the idea of **Time**. From the observation of various objects springs the idea of **Number**. When observing various objects, some like and some unlike, the idea of **Resemblance** and of **Difference** arises. You see this book. Try to think that what you see has no being, does not cause your sensation, is not in space or time, is not distinguishable from any other thing. You will see why the ideas of Being, Space, etc., are called *necessary*. Remember that at first these ideas are of concrete realities. I know that this plant exists, has being; that this agreeable sound is caused by the piano; that the clock is in space; that I see my friend at this time; that these rose-bushes are numerous; that the roses on this bush are alike and different from those on the neighboring bush. Abstract ideas of cause, time, etc., are of later growth.

Some	{	Being,
Important		Cause,
Necessary Ideas		Space,
are those of		Time,
		Number,
		Resemblance and Difference. <sup>1</sup>

shall I forget the phenomenon in myself, never till now recited, when I stood by the birth of my own self-consciousness, the place and time of which are distinct in my memory. On a certain forenoon I stood, a very young child, within the house door, and was looking out toward the wood-pile, as, in an instant, the inner revelation, 'I am I,' like lightning from heaven, flashed and stood brightly before me; in that moment I had seen myself as I, for the first time and forever."

<sup>1</sup> See Appendix, and compare list of Intuitions. Compare

Three tests of necessary ideas are usually given: *Self-evidence, Necessity, Universality*. That space exists is self-evident, needs no demonstration; attempt to remove space, you leave space behind. It is necessary; objects cannot exist without it. Its existence is known by all intelligent human beings.

Necessary ideas are ideas of realities not perceived through the senses; these ideas are developed by experience; they are at first concrete but may become abstract; their tests are *Self-evidence, Necessity, Universality*.

**29. DIFFERENCE AND AGREEMENT. EDUCATION OF THE SENSES (31).** Growth of perception may be viewed as growth of discriminative power, that is, consciousness of differences and agreements. We distinguish one object from another, one sensation from another, and we distinguish between the varying degrees of a sensation. We also discover agreements. Objects possessing like qualities are recognized in their proper relation, and a second view of an object recalls the previous perception.<sup>1</sup> Without discrimination there could be no knowledge. Through discrimination the mist

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White, *Elements of Pedagogy*, p. 44. It is very difficult to make a satisfactory list of Necessary Ideas. Apply the tests at the end of the section to the following: Mind, Matter, Infinity, Truth, Right, Beauty.

<sup>1</sup> Bain makes these statements: "The primary attributes of Intellect are (1) Consciousness of *Difference*, (2) Consciousness of *Agreement*, and (3) *Retentiveness*. Every properly intellectual function involves one or more of these attributes."

"All knowledge finally resolves itself into Differences and Agreements. To define anything, as a circle, is to state its agreements with some things (genus) and its differences from other things (differentia)."



gradually vanishes and objects appear distinctly in the clear light.

The power of the organs of sense varies in different persons. Some are susceptible to a wider range of auditory impressions than others. The optic nerve of one may be affected by a faint excitant, while that of another responds only to light of greater intensity. Some are color-blind.<sup>1</sup> The discriminative power of the mind through the senses is increased by practice. The tea-taster becomes very acute and discriminating in the sense of taste and of smell. The musician is very exact with reference to pitch or quality of tone. Touch may become sensitive to the finest distinctions in the texture of fabrics. A blind person gains more knowledge through the sense of touch than one blest with vision. The artist detects shades of color imperceptible to the untrained sense. By education of the senses the world of beauty is revealed more fully to the mind. The quickness, accuracy and grasp of discriminative power determine an important part of the intellectual character.<sup>2</sup>

#### APPLICATIONS.

**30. ACTIVITY OF CHILDHOOD IN RELATION TO PERCEPTION. KINDERGARTEN METHODS** (20). In the development of mind, Perception is first. It is through sensation and perception that the mind is first

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<sup>1</sup> Variations in the sense organs are to be distinguished from mental variations. For a summary of the results of experiments to ascertain the time-relations of mental phenomena, see Ladd, pp. 468, 469.

<sup>2</sup> Carpenter relates of the celebrated conjurer, Robert Houdin,

awakened to consciousness. The necessity for constant exercise of the faculty at this period is met by the spontaneous activity of childhood. Repression of such activity is contrary to what Nature intends. Every movement, every exercise of voice, every observation of objects through touch or sight is giving the child control of the body through sensation, and cultivating the power and accuracy of the senses. Play with toys, inquiry about objects and their names add to the child's knowledge of the world through Perception and through the rudimentary exercise of other faculties.<sup>1</sup>

Thus the period of childhood, before the training of the schools begins, is a most important one. Education has already begun and the mind is accumu-

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the manner in which he prepared himself and son for the performance of certain marvelous tricks. Amongst other things, "the father and son often passed rapidly before a toy-shop, or any other displaying a variety of wares ; and each cast an attentive glance upon it. A few steps farther on, each drew paper and pencil from his pocket, and tried which could enumerate the greater number of objects seen in passing. The son surpassed the father in quickness of apprehension being often able to write down forty objects, whilst his father could scarcely reach thirty ; yet on their return to verify his statement he was rarely found to have made a mistake."

<sup>1</sup> "Children should be taught from their earliest years to use their senses intelligently and habitually. They should be encouraged to observe carefully the objects around them, and taught to describe and report them correctly . . . Pictures and models are used very extensively in modern education, and serve a good purpose, as they call in the senses to minister to the intellect. But the things themselves are vastly more instructive than any representations can be. So children should be taught to use their senses, especially their ears and their eyes, in ob-

lating many ideas of the outer world. The perceptive knowledge thus gained is the ground-work for the formal instruction of the schools. The degree of education and the amount of knowledge the child already has, when entering the Primary grades, is not always recognized in the methods there employed.

The methods of the true Kindergarten are founded upon a most philosophical basis. The bodily activity, the observation, the practice of modeling, the study of form and figure, are in the main a continuation of the processes of Nature, and they beget habits of accuracy in perception and representation which constitute the best foundation for higher knowledge.

**31. CULTIVATION OF DISCRIMINATIVE POWER.<sup>1</sup> DISTINCT IMAGES** (24, 29). The act of discovering agreements and differences is naturally one of pleasure to the child, and his mind is easily led to such discovery. In respect to color, figure and size the discriminative power may be cultivated by contrasting different colors and shades of the same color, by tracing the figure of objects in pictures and comparing one picture with another, by superimposing geometrical figures cut out in card-board, and by placing similar objects of different size near each other. Geometrical forms

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serving the objects around them, and the events that occur, and storing them up for future reflection. Plants and animals and stars, men and women and children, fall under our eyes at all times, and their nature, shapes, and actings should be diligently scanned for practical use and for scientific attainment."—Dr. McCosh, *Psychology*, p. 61.

<sup>1</sup> See Tate, Part II, Chap. II.

may be known by handling them, by counting the sides, edges and angles; the conception of number is best acquired by handling concrete units, by grouping and comparing them. Lengths and distances may be discriminated by drawing and comparing lines, by measuring with a rule, etc.<sup>1</sup>

If to the observation of objects is added the drawing and naming of them, and the expression of simple judgments about them, the best kind of work in the cultivation of perception has been accomplished. Nothing else so fixes the attention and cultivates the use of eye and hand as the drawing of objects. An important use of drawing in schools is to promote the growth of accuracy in Perception.

Distinct images are the necessary basis of knowledge. They are the material for the use of the higher faculties, and upon the number and character of the images acquired by perception, much of the character of future growth will depend.

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<sup>1</sup> The following simple lesson in Psychology given by Tate may be taught even to a child: "T. What shape has this object (a ball)? P. It is round. T. How do you know that it is round? P. I *see* that it is round. T. Is there no other way by which you can know that it is round? You seem to hesitate,—now take it in your hand and run your fingers over its surface. P. I *feel* that it is round. T. But your feeling tells you of another property which that object has—what is that property? P. It *feels* smooth. T. But there is another way by which you know it is smooth. P. It *looks* smooth,—it is glossy or *bright*. T. True—your experience teaches you that bodies which are bright or glossy are almost always smooth. Now close your eyes and take this body in your hands,—can you feel what color it has? P. I cannot *feel* color. T. Now open your eyes and tell me what color it has. P. I *see* that it is red."

**32. PRINCIPLES APPLIED TO THE VARIOUS BRANCHES OF STUDY.** Any system of school instruction which would supplement what Nature does for the child through the senses, should employ the methods of Nature. The Kindergarten helps Nature by increasing the extent and accuracy of natural observation. Objects themselves are employed instead of the signs of objects, namely, mere words. "The thing itself before the sign" is the grand maxim for early education. This same principle, in spirit, should be employed in all grades of work.

Accordingly the first steps in Reading are taught by giving accurate ideas of objects through Perception; then the object or act is associated with the printed sign, so that the word may truly stand as the sign of an idea. The notion of abstract number is developed by handling, counting and arranging objects; by dividing an object into equal parts, so that the written sign, the figure, may stand for definite knowledge. Geography should not be taught wholly by maps and descriptions, but the objects of nature around us, the hills, streams, and valleys, should be used as elements with which to construct the world. Description must often be substituted for observation. Descriptions of persons and of interesting events in History are an excellent preparation for the later generalizations in that study. Language should first be taught by example and then by rule. In the elementary study of science, objects and specimens should be handled and experiments should be performed. From specimens and experiments classes may be made and principles may be inferred. This method makes the mind observant and eager. The student of Psychology can

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understand and verify its principles by careful study of the objects of the mind's consciousness.<sup>1</sup>

### EXERCISES.

1. Show in what sense Perceiving, Remembering and Reasoning are acts of Knowledge.

2. Show the aptness of the terms Presentation and Representation as applied to Intellectual acts.

3. Show in your own way the difference between Sensation and Perception.

4. How is consciousness developed ?

5. How does the Mind acquire the idea of externality ?

6. State in detail how the size of an object is known by touch ; how the difference between a rough and a smooth surface is known.

7. How can we tell by the eye that a body is hard, smooth, distant, of a certain size ? Describe each process in detail.

8. Trace in detail the development of Perception in connection with Hearing.

9. What original knowledge is given by Taste ?

10. One born without sight and hearing would lack what knowledge of the world ?

11. Do we know Matter, or do we know only its qualities ?

12. Give an original example of the grouping of the separate elements in perception of a *material object*.

13. Make clear the difference between a Percept and an Image ; the difference between an object of Sense-Perception, an object of Consciousness and a Necessary Idea.

14. How does the notion of Power grow out of Perception ; the notion of Time ?

15. Show in a general way that the growth of visual perception is a growth in discrimination.

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<sup>1</sup> These applications would likewise fall under the head of Memory, Imagination, and Reasoning, but the spirit of these statements is suggested by the principles of Perception.

**16.** Give some examples of a high cultivation of sense-perception.

**17.** The following is a diagram showing the perceptive process through the sense of sight. Continue the diagram for Hearing ; for the other senses.

Sense	Stimulus or Excitant	Sensation	Direct Perception	Acquired Perception
Sight	Light waves	Color	Quality of color	Size, Form, Figure, Distance, etc.

**18.** Is great activity in children a fault ?

**19.** Make some estimate of the knowledge that the average child first brings with him to the school.

**20.** How would you teach a child to read ? Give reason for the method.

## REPRESENTATION.

### INTRODUCTION.

**33. NATURE OF REPRESENTATION.** A few years since I stood with some friends upon one of the higher elevations of the foothills in the Rocky Mountains. As we looked to the east, we saw the gray billowy plains, stretching away, seemingly as vast as the ocean, toward the mists and clouds of the horizon. On the west, wild, torn, and rugged, barren and snow-capped, extended the Rocky Range, while toward the south, over beyond a vast amphitheater, rose in grand succession, terrace, range, and dome, covered with forests of dark pine, lighted here and there with a group of aspens, growing golden in the autumn sun. All, I think, who viewed the scene, were thrilled with emotions of grandeur and beauty, and touched with the kindred feelings of courage and aspiration. Those same grand features of Nature, the thoughts and emotions awakened, the clear sky and bright sun, the few fleecy clouds moving slowly above the summits, the feeling of freshness and vigor from the pure, cool air, many incidents of the day, the faces of the friends, I can see now after the lapse of years. This is a representation to the "mind's eye" of what was then present to the senses, a revival of the impressions of



perception in the form of mental *Images*.<sup>1</sup> These are not perfect in all their detail, they are not so vivid as at the time of observation, but they are more or less accurate pictures of what I then saw. Moreover here is a reproduction of the thoughts and feelings, all the experiences of the day, in the form of Representative Ideas.

It may be noted :

1. Knowledge of a present object through the senses is Presentative; presentative knowledge and any new mental experience, revived, are called Representative.<sup>2</sup>

2. Representative objects are mental, not external. I saw the mountains as external objects, present to the senses; what I now see is a mental picture.

3. Representative objects are less vivid than the original. Look at some object, then close the eyes and picture it; the mental image greatly differs in distinctness.

4. Representative objects are not complete in detail.

<sup>1</sup> " My eyes make pictures, when they are shut:—

I see a Fountain, large and fair,

A Willow and a ruined Hut."

COLERIDGE, in *A Day Dream*.

<sup>2</sup> Some physiologists claim that the revival of images is due to an effect produced upon the structure of the brain by acts of perception, creating a tendency to a repetition of the same nervous action, in the same nerve centers. Hamilton, however, claims that this supposition is not necessary. See Hamilton, Lect. XXX, p. 419. Read Ladd, p. 550. McCosh expresses his view thus: "Brain action is required in order to the reproduction of our sense-perceptions. Now it is highly probable that the same part of the brain acting in the perception is necessary in order to its reproduction. When there is a lesion of a certain part of the brain, it may not be possible to form an image of the object. In all cases the vividness of the image may depend on the health and the susceptibility of the brain matter."

What I now recall is but an imperfect outline of the grand scenery then viewed in all its rich variety.

5. **Representation is not confined to any one sense or to the senses.** The sound of music, our sensations, the various kinds and shades of emotion, the thoughts and fancies of the mind may be recalled. Any experience of the soul may live again in memory.

“Music, when soft voices die,  
Vibrates in the memory—  
Odors, when sweet violets sicken,  
Live within the sense they quicken.”

Dr. McCosh says: “It should be specially noticed that not only are we able to represent sensible scenes; we are further able to picture the thoughts and feelings which passed through our minds as we mingled in them.”

We may now attempt a definition: **Representation is the act of reproducing a percept or any former conscious experience in the form of an Image or Representative Idea.**<sup>1</sup>

We may add other important considerations of the subject. **Representation is involved in Perception.** The sight of an orange may bring into mind all that has been learned of it through touch, taste and smell; the odor of a rose may bring with it the appearance of the flower; a rumbling sound will revive the image of a passing carriage. Perception as an original source of knowledge would be almost valueless, if it were not aided by the memory. **Representation is the condition of higher intellectual processes.** It preserves the mate-

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<sup>1</sup> “Literally signifying Image, the term *Idea* may stand for all those operations in which there is a reproduction of past experiences.”

rial acquired by perception and presents it to the use of the Conceptive and Reasoning faculties.

**34. VARIETIES OF REPRESENTATION.** The experiences of the past come back to us in various degrees of completeness, and they are sometimes so grouped as almost to defy recognition. (1) My mind may dwell upon a mountain or lake scene viewed in some former pleasure trip ; upon the stirring events of the previous week, or the labors of yesterday ; and each important object and incident is referred to its proper time and place and known as a former object of cognition. (2) In moments of leisure, fragments of scenes and objects or bits of fancy may float through the mind, and we may not know whence they come or whether they were a part of our former experience. (3) The artist sits at his easel and constructs an ideal scene, using as elements past perceptions, but grouping them into a new whole with different forms and relations.

There are three forms of Representation which may be defined as follows :

The power to retain, represent and recognize former objects of perception and former experience is known as **Memory**.

The power to represent objects without recognition is known as **Phantasy**.

The power to reproduce, to modify and to recombine the material furnished by perception is called **Imagination**.

**35. DIFFERENCES AND AGREEMENTS IN REPRESENTATION** (53, 1). Bain says, " The primary attributes of Intellect are (1) consciousness of Difference, (2) consciousness of Agreement, and (3) Retentiveness. Every properly intellectual function involves one or more of

these attributes. . . . A delicate discrimination is thus the condition of all retentiveness, as it marks out clearly the distinctive features of what is to be retained. . . . It must be taken for granted until the contrary is shown, that the delicate feeling of Agreement follows Discrimination, and that Retentiveness will follow both. Once for all, therefore, we may assume that delicacy of Discrimination is to be accepted as the criterion of all the intellectual properties. Hence, when a sense has an unusual degree of discriminative power, there will be an unusual retentiveness for its sensations." Bain here refers to Agreement and Difference in Perception as the *condition* of Memory; but the *act* of Memory involves a marking off of what is remembered from some things, and it must involve an association of similarity with other things. To be conscious of an image, is to be conscious of it as a *distinct* thing. *Confusion* of memory is failure to distinguish the facts as originally acquired. In the use of the Imagination, the finer the discriminative power, the more highly finished the product will be.

#### MEMORY.

**36. PRIMARY LAWS OF ASSOCIATION**<sup>1</sup> (53, 2-4). The ceaseless activity of our minds in our waking moments, much of which is employed in recalling the past, often seems to be governed by chance; but, if we carefully review any train of memory, we may be able to trace some connection of one idea with another, and see that every idea was naturally suggested

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<sup>1</sup> Read Porter, §§ 245-256; McCosh, Psychology, pp. 112-135.

by the one preceding it. This connection is sometimes difficult to trace, but it always exists. I may be thinking at one moment of the artistic merit of the play of Hamlet, at the next of a Chinaman's cue. These surely do not seem kindred subjects. I review the journey from the one idea to the other thus:—Hamlet, Shakespeare, England, England's military renown, France, the French war in Tonquin, China, the Chinese in America, the appearance of a Chinaman whom I passed on the street,—and so my thought has traveled around the world to reach but a trivial idea.

By examining a large number of instances of sequence in memory, philosophers have discovered the relations which bind ideas together and have expressed the action of the mind in accordance with these relations as Laws of Association.

1. The American Congress may remind one of the British Parliament. Some feature of a new landscape, similar to a portion of one long familiar to us, may awaken recollection. **Objects which resemble each other tend to recall each the other.**<sup>1</sup> In the first example, our knowledge of Congress and of Parliament has always been connected with the idea of "Legislative Body"; when a mention of the one recalls the other, the mind through the link of Identity is simply acting as it has done before. In the example of the landscape, the similar feature acts upon the mind as a *substitute* for the familiar feature, and the mind not only dwells upon that feature but reviews the whole landscape in memory as it was accustomed to do in perception.

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<sup>1</sup> This involves the law of Analogy: *Analogous objects tend to recall each other.* Examples: Sunshine suggests prosperity; mist, confusion; a lion, courage; an oak, strength; etc.

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Observe that, when recalling through resemblance, *the mind repeats in idea the process of acquisition.*

2. Riches may suggest poverty; light, darkness; a hill, a mountain; virtue, vice; etc. **Contrasted ideas tend to recall each other.** It is a law of the mind to *define* or acquire certain ideas by contrast; therefore when an idea recalls its opposite, *the mind acts as it did before.*

3. In connection we think of Paris and the French Revolution, Cæsar and Rome, Egypt and the Pyramids, autumn and harvest, childhood and our early home. **Objects and ideas associated in the same time or place tend to recall each other.** Cæsar and Rome were originally studied in the same connection. Certain objects and events were habitually observed in connection with the home of childhood; in old age, whenever the image of that home arises, the mind reviews many of the associated scenes. Again, *the mind acts in a manner similar to that in which it acted before.*

4. A train of cars in motion suggests steam-power; a knife, a wound; a fire, warmth. **Ideas related as cause and effect tend to recall each other.** Cause and effect are frequently viewed together; hence, when the effect brings up the cause or the cause the effect, *the mind reproduces the original act of observation.*

The relations by which one idea tends to recall another are (1) Resemblance, (2) Contrast, (3) Contiguity in Time and Place, (4) Cause and Effect.

In studying each of these relations it has been noted that there is no virtue in the relations themselves, but that the mind acquires knowledge in these relations, and tends to recall it in the same relations. The natural and the incidental associations in the ac-

quisition of knowledge become the principles of association in memory. Hence Dr. Porter has expressed the four Laws of Association in the form of one "Comprehensive Principle": "The mind tends to act again more readily in a manner or form similar to any in which it has acted before." <sup>1</sup>

Bain says of the laws of Association: "With few exceptions, the facts of Retentiveness may be comprehended under the principle called the law of Contiguity, or Contiguous adhesion." He thus states the principle: "Actions, sensations and states of feeling, occurring together or in close succession, tend to grow together or cohere in such a way that when any of them is afterward presented to the mind, the others are apt to be brought up in idea."

**37. SECONDARY LAWS OF ASSOCIATION** (53, 5-10).  
While the mind ever acts in accordance with the

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"Association of ideas must depend partly on the brain, on the gray cellular matter at the periphery, or on the currents through the brain, or, as I rather think, on both, the nature and disposition of the cells determining the direction of the currents. . . . I believe that every thought and every feeling produces an effect upon the cellular portion of the brain and leaves an impress upon it. Now in order to the reproduction of the thought and feeling in memory, it seems to be necessary to have a coöperation of the organ of the brain thus affected, and to have the aid of the currents. When the association has not this concurrence it is hindered and restrained."—McCOSH, *Psychology*, p. 145.

"And slight withal may be the things which bring  
Back on the heart the weight which it would fling  
Aside forever ; it may be a sound—  
A tone of music—summer's eve—or spring—  
A flower—the wind—the ocean—which shall wound :  
Striking the electric chain wherewith we are darkly bound."

BYRON, *Childe Harold*.

**Primary Laws of Association**, there are certain conditions which favor the recall of some ideas more than others. These conditions, stated, are called the **Secondary Laws of Association**.

1. The student becomes interested in the subject of electricity and studies it earnestly; he readily recalls the facts and principles of that branch of Physics. The incidents of a day of joyous pleasure, the events attending a period of crushing sorrow, will ever be remembered. **Ideas acquired by earnest attention and events attended by deep emotion are easily recalled.**

2. You find a chapter in history unattractive, but you go over it again and again and succeed in impressing the leading facts upon the mind. **Familiar objects, and thoughts often reviewed, are readily recalled.**

3. The events of yesterday, the lesson of to-day, are fresh in mind, and they come up repeatedly; years hence they may be entirely forgotten. **Recent experience is likely to be recalled.**

4. A person in good health will think of cheerful subjects, one in ill health of gloomy. A physician will think of subjects connected with his profession. One boy constantly turns to thoughts of play, another dwells upon his studies. **The likelihood of the revival of some ideas is affected by health and by natural or acquired tendencies.**

The conditions which favor the recall of ideas are as follows: (1) **Exclusive attention and clear discrimination during acquisition.** (2) **Repetition.** (3) **Recentness of experience.** (4) **Accordance with individual feelings, habits, and tendencies.**<sup>1</sup>

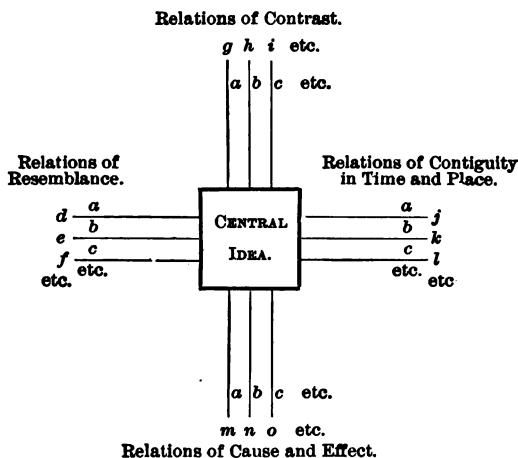
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<sup>1</sup> Compare Porter, § 256.

How interest and occupation may give direction to the thoughts,



The idea present in the mind at any moment may be regarded as a central object with links of association connecting it with many other objects. These links may be viewed as the means by which the mind may recover associated objects. A diagram may make clearer the Primary Laws and the relation of the Secondary Laws to them.



(1) An idea in mind at a given moment may be related to one or more ideas by Resemblance; to other

the mind acting under the Primary Laws of Similarity and Contiguity, is shown by this extract from Shakespeare's *Merchant of Venice*. That the thoughts suggested are mainly of the imagination rather than of the memory, does not detract from the value of the illustration.

“My wind cooling my broth,  
Would blow me to an ague, when I thought  
What harm a wind too great might do at sea.  
I should not see the sandy hour-glass run,  
But I should think of shallows and of flats,

ideas by contrast, etc. (2) An idea in mind may be linked to one and the same idea by each of the four kinds of relation. (3) Whether *a* will be recalled rather than *b*, or *d* recalled rather than *g*, is determined by the Secondary Laws.

**38. THE PRINCIPLE OF CONTIGUITY APPLIED TO AGGREGATES, MOVEMENTS, AUDITORY AND VISUAL TRAINS, PARALLEL TRAINS.** 1. **Aggregates.** The mind fuses the impressions of an object received through the several senses, and the product is an aggregate known as an idea of the object. In the same way we form an image of an extended landscape, or picture the map of a country as a whole, and in the relation of its parts. In each of these instances any one of the related parts may recall the whole.

2. **Movements.** Physical movements directed to some end originally require conscious effort. Such are learning to walk, learning to use the voice in speaking and in singing, and practice in manual dexterity. The muscular, the tactual, the auditory or the visual impressions made upon the mind during the acquisition of skillful movements form a series, and they are employed in recalling and directing movements. The

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And see my wealthy andrew docked in sand,  
Vailing her high top lower than her ribs,  
To kiss her burial. Should I go to church,  
And see the holy edifice of stone,  
And not bethink me straight of dangerous rocks,  
Which, touching but my gentle vessel's side,  
Would scatter all the spices on the stream,  
Enrobe the roaring waters with my silks;  
And in a word,—but even now worth this,  
And now worth nothing."

separate impressions forming the series finally become so united that movements may be performed almost or quite automatically, after the mind has decided upon a particular action. This is called perfect habit.<sup>1</sup>

3. **Auditory and Visual Trains.** Vocal sounds formed into words and sentences, tones fashioned into strains of music, produce trains of auditory impressions. These trains enable us to retain and repeat the sounds and tones in order. Many muscular movements depend in part upon aggregates or trains of visual images. This fact may be shown by an attempt to write in the dark. When reading from a book, the images of the printed words impress themselves upon the mind in order, and they aid the memory.

4. **Parallel Trains.** Memory often depends upon parallel trains. Suppose one is memorizing thought from the printed page. (1) The mind forms the habit of thinking the thoughts in the order suggested by the words. (2) The emotions awakened by the thoughts may form an imperfect series. (3) The mind forms a series of the visual signs, namely, the printed words. (4) If the passage be read aloud, an auditory series is established. (5) We might mention also the muscular habit of repeating the words in a given order. Thus in committing to memory there may be formed four or five parallel series of mental impressions, each series more or less complete. Any one of the trains may aid in recalling the thought.

**39. LANGUAGE**<sup>2</sup> (53, 11). Through Perception and

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<sup>1</sup> See Bain, Book II, Chap. I, Movements, p. 86.

<sup>2</sup> Read Locke, Bk. III, Chaps. I and II.

<sup>3</sup> "It may also lead us a little toward the original of all our

Memory we acquire and retain a knowledge of things and their qualities. As we shall learn under "Thinking," the mind may form a notion of a group of similar things called a concept; it may note a relation between things, i. e., form a judgment concerning them; and it may discover a relation between things by a mediate process called Reasoning. To our knowledge—of things and their qualities, of groups of things, and of relations between things—the mind naturally seeks to give expression by means of signs. The natural signs are facial expression, bodily attitudes and gestures and inarticulate cries. In earlier stages of civilization Picture-Writing is employed to express knowledge. Spoken words and their written signs are the ordinary means of communicating knowledge. A word is the sign of some idea. Words possess their full value only when they stand for distinct and definite knowledge.

From childhood, by constant repetition, word signs

notions and knowledge, if we remark how great a dependence our words have on common sensible ideas; and how those, which are made use of to stand for actions and notions quite removed from sense, have their rise from thence, and from obvious sensible ideas are transferred to more abstruse significations, and made to stand for ideas that come not under the cognizance of our senses; v.g. to imagine, apprehend, comprehend, adhere, conceive, instil, disgust, disturbance, tranquillity, etc., are all words taken from the operations of sensible things, and applied to certain modes of thinking. Spirit, in its primary signification, is breath; angel, a messenger; and I doubt not, if we should trace them to their sources, we should find, in all languages, the names which stand for things that fall not under our senses, to have had their first rise from sensible ideas."—LOCKE, *Human Understanding*.

are inseparably connected with the things which they represent, so that the sign, when employed, brings forward the notion of the thing. By constant use of a given word for the same purpose, the object represented becomes more clearly defined in Perception and Memory.

The more important use of language is in connection with Thinking, because we deal with groups, relations, and acts more than with individual objects. We may perceive objects and recall their images without language, but it is difficult, if not impossible, to *think* without language. The use of language in Conception, Judgment and Reasoning will be considered later.

**40. MEMORY NECESSARY TO THE IDEA OF TIME.** The idea of Time involves Memory. Without representation, at least of the immediate past, the idea of succession could not arise. To gain an idea of past time some image or experience recalled must be contrasted with present perception or feeling; thus the idea of *not-now* and *now* arises. For instance, a child is enjoying a toy, if he be deprived of the toy he is conscious of present grief; at the same time the picture of his previous enjoyment persists in his memory. The idea of future time arises in a similar way. The child becomes habituated to a series of customary events, and, at any point in the series, pictures that which usually follows. For instance, the dinner usually follows the call of the bell; if the dinner be delayed the child vividly represents the appeasing of his hunger, and now locates that event in the future. By the law of memory, we recall important events in the order of their occurrence, as A, B, C, more easily than in an inverted or confused order, as B, C, A. After a while casual

events are referred, in point of time, to the regular recurrence of known events, as day and night, the lapse of the weeks and seasons. We say "It happened yesterday," "The Independence of the Colonies was declared in 1776."

**41. VARIETIES OF MEMORY** (53, 12-15). The humorist has a good memory for stories, the philosopher for theories, the accountant for figures, the historian for events. *The kind of memory is partly due to occupation and natural tendency.* One may have a remarkable memory for visual, another for auditory impressions. An English portrait painter was accustomed to require but one sitting; afterward he pictured the subject sitting in the chair before him and painted from memory. A friend, when studying as an artist in Rome, copied the original painting of Beatrice Cenci, which was carefully guarded in the Cenci Palace. He with other visitors occasionally gained admittance to look at the celebrated picture; he would then go to his studio and paint from memory. The copy was regarded as a model of accuracy. Mozart wrote down from memory the "Miserere" after he had heard it but once. Beethoven was entirely deaf when he composed many of his great works. *Remarkable visual or auditory memory is due both to native endowment and to habit.* A person all of whose faculties are quick in their operation has a *Ready Memory*. One whose impressions are naturally vivid or who is thorough in his methods of acquisition has a *Retentive Memory*.

The two important classes of memory are known as the *Circumstantial* and the *Philosophical*. A most excellent illustration of the former is the frequently quoted speech of Dame Quickly, from "King Henry IV," Sec-

ond Part:—"Thou didst swear to me upon a parcel-gilt goblet, sitting in my dolphin chamber, at the round table, by a sea-coal fire, upon Wednesday in Whitsun week, when the Prince broke thy head for liking his father to a singing man of Windsor; thou didst swear to me then, as I was washing thy wound, to marry me, and make me my lady, thy wife." Uneducated people are likely to remember the details of trifling events because their lives are largely made up of those events.

A person who is accustomed to arrange facts under principles, to place them in natural groups or in the relation of cause and effect, will employ the philosophical memory. He will readily recall the principles of a science, and the necessary steps of reasoning in mathematics. He will remember a rule of arithmetic or a formula of mechanics, because he can construct it for himself. Theories, trains of argument, reasons are easily remembered because his mind, finding an interest in them, habitually dwells upon them.

**42. PERMANENT ACQUISITION AT DIFFERENT PERIODS OF LIFE.** Some physiologists believe that "nerve-tracks" in the brain constitute the mechanism of association in memory. Whether this view be accepted or not, it is clearly true that, in early years, when the brain is growing, permanent impressions are easily made. During middle life, after the structure of the brain has become more or less fixed, the mind is still capable of retentive acquisition, although not to the same extent as in youth. In old age when the nutritive and vital powers are feeble new impressions are much less likely to become fixed, although the im-

pressions of youth may be retained in all their vividness.<sup>1</sup>

When we think of the effect of early training upon character, we must believe that childhood is the period for permanent moral impressions. All physical habits, such as attitudes of body, skill in drawing, may be acquired more successfully in early years, than in later life. Says Bain:—"As regards the mental peculiarities, the earliest periods are most susceptible to Moral impressions; also to Physical habits, such as bodily carriage, the mechanical part of language (pronunciation), or the use of the hand as in drawing. After these come the Verbal memory, and the exercise of the senses in Observation, with the corresponding pictorial recollections. The Generalizing, Abstracting and Scientific faculties are much later; Arithmetic, Grammar, Geometry, Physical Science, etc., begin to be possible from the tenth year onwards. Up to fourteen or sixteen, the concrete side of education must prevail with the vast majority, although by that time, a good many abstract elements should be mastered, more especially mathematics and grammar. The basis of every aptitude, not of a high scientific kind, should be laid before sixteen."<sup>2</sup>

**43. POWER AND CULTIVATION OF MEMORY** (53, 16-17). Biography is filled with examples of wonderful memory. It is said of Pascal that he forgot nothing of what he had done, read, or thought. The memory of

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<sup>1</sup> Read Carpenter, Bk. II, Chap. X, § 351.

<sup>2</sup> On the subject of Acquisition read Bain, Bk. II, Chap. I, pp. 114-127.



the ancients was probably excellent because knowledge was not then as now stored in books easy of access, and they were compelled to exercise the memory.<sup>1</sup> In our experiences there is every degree of attention, and hence of mental impression. Very much of that which we perceive and think quickly vanishes, and a large portion probably beyond the power of recall. Yet there are remarkable instances of revival of impressions that must have been extremely faint when made.<sup>2</sup>

The important factors in the cultivation of memory are *interest* and *attention*. All the laws of attention are here applicable. In childhood the attention is secured by presenting what is naturally interesting. Later, the memory is to be cultivated by the performance of assigned tasks. That which of itself possesses little interest may be studied with intense interest, because it is a means to some end, such as the gaining of power, knowledge, honor, or happiness.

All the intellectual faculties may be strengthened by exercise, and the memory not less than the others. The power of memory has its limits; and probably its excessive cultivation detracts from the energy of the other powers. Some writers believe that a poor

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<sup>1</sup> "Leibnitz and Euler were not less celebrated for their intelligence than for their memory, and both could repeat the whole of the *Æneid*. . . . Ben Jonson tells us that he could repeat all he had ever written and whole books that he had read. Themistocles could call by their names the twenty thousand citizens of Athens; Cyrus is reported to have known the name of every soldier in his army." For further examples of remarkable memory, see Hamilton, Lect. XXXI.

<sup>2</sup> For illustrations, see Carpenter, Chap. X, Memory.

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memory, as a whole, cannot be cultivated to an extraordinary degree ; but that any variety of memory may be strengthened by persistent exercise.

Although the memory in advanced years may not be good, there is a recompense in the fact that extensive knowledge aids fresh acquisition. New ideas overlap our previous knowledge, and may be recalled by links of association already formed. A large store of historical information aids the retention of any new fact, by associating it with similar facts of other periods. In retaining new ideas the bond of similarity is a very important one.

#### PHANTASY.

**44. ILLUSTRATIONS. SUMMARY.** The power of Phantasy reproduces images severed from relations of time, place, and previous perception.<sup>1</sup> In phantasy the mind acts "capriciously without regard to truth, law, and reality." "*Day Dreams*" illustrate this form of Representation. The body is at ease, will and judgment are almost passive, and the images come and go at pleasure, and are viewed as the figures of a panorama, without effort to define, locate, or explain them. Reverie shows the constant activity of the mind. It is a rest to the weary brain and a source of pleasure. Often the phantasms of reverie may be wrought into useful ideals.

In *Sleep*, when the senses and most of the faculties are inoperative, when the mind is thus shut off from communication with the external world and from any

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<sup>1</sup> Porter, § 310.

correct knowledge of bodily conditions, images alone may be objects of consciousness and may gambol uncontrolled by the judgment.<sup>1</sup> In dreamland one may fall over a precipice and alight without injury, may see a carriage driven up a chimney, or by the mere energy of muscular tension may rise and float over trees and houses at will. In *Somnambulism*, attended by dreams, however distinct and definite the mental images, there is no proper recognition of them at the time, and they are not afterward remembered as realities.<sup>2</sup>

In *Delirium* and some forms of *Insanity* the brain is diseased, the faculties are disordered, and no accurate judgment is brought to the interpretation of mental images, or the morbid physical sensations which in some cases may produce them. The mind is partly severed from its intelligent relations with the outer world, and dwells in the world of incongruous images, where distorted creations from present sensations mingle with confused and unrecognized images of the memory.<sup>3</sup>

**The Phantasy is that form of Representation which appears in Reverie, Dreaming, Somnambulism, Hypnotism,<sup>4</sup> Delirium, Insanity, and in certain Hallucinations.**

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<sup>1</sup> For an extended discussion of the phenomena of sleep, see Porter, §§ 314-327.

<sup>2</sup> For an account of somnambulistic states see Porter, §§ 327-342.

<sup>3</sup> Read Carpenter, Chap. XVIII, on Insanity.

<sup>4</sup> See Carpenter, Hypnotism, Chap. XV, § 493 to end of chapter.

"The true explanation of Hypnotism appears to be as follows: (a) The fixing of attention produces an *arrest* of the ordinary activities of the brain; (b) the ordinary activities of the brain being arrested, a condition of unstable *equilibrium* is produced: (c)

45. **HALLUCINATIONS.** Goethe, when he closed his eyes and depressed his head, could cause fantastic flowers to spring up and unfold in the field of vision. Recall the illustration of the artist who, in the absence of the subject, could seat the image in a chair before him and thus paint from memory. In these instances, when the attention was turned from the images, they disappeared, and ordinary perception and memory held sway.

There are cases, however, in which the images persist, are spontaneously projected into space before the person, and appear to be real objects. Macbeth sees

“A dagger of the mind, a false creation,  
Proceeding from the heat-oppressed brain.”

Here is an unusual excitement of the optic centers of the brain which is referred to an external cause. In all such cases it is supposed that the brain centers which are instrumental in forming images are excited and unusually active, indeed so active that the images of memory are more vivid than the impressions of perception. In this condition a person may look at the wall of a room, and not see the wall but seem to see an image situated between him and the wall.

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this unstable equilibrium renders easy an involuntary *ideo-motor action* when any particular idea is formed by suggestion in the consciousness of the subject; (d) an idea is *suggested* to the mind of the subject by the hypnotizer; and (e) this idea *reacts involuntarily* upon the brain, producing a corresponding *ideo-motor action*. All is involuntary, but all takes place through consciousness. The state of hypnotism seems to be one in which will is surrendered and *ideo-motor action* is left automatic.”—D. J. HILL.

Note that all which is necessary to this result is that the image be stronger than the perception. When the undue excitement of the ideational centers is reduced, the impressions of perception again become the more vivid, and the hallucination disappears.<sup>1</sup>

**46. LAWS OF ASSOCIATION IN PHANTASY.** Are phantasms governed by the laws of association? In some forms of Phantasy, it is difficult to investigate this question, but these laws undoubtedly operate in reverie and dreaming. If we arouse ourselves from reverie, and review the succession of images, frequently we may trace their connection. Fancy is linked unto fancy. The habit produced by vivid trains of thought, the experiences of early years, or the impressions of the previous day may give direction to our dreams. Physical sensations may also suggest the dream as they suggest thoughts in waking moments. Even in summer, during sleep a chilly sensation may be attended by a view of an open window

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<sup>1</sup> "Many circumstances, organic or moral, the action of haschish, of datura, of opium, the coming on of apoplexy, different inflammatory diseases, different cerebral alterations, in short, a number of causes, more or less remote or near, are capable of thus strengthening an image or series of images, so as to annul the special sensation which should repress it, and thus bring on hallucination."

"Solitude, silence, obscurity, the want of attention, all circumstances in short which suppress or diminish the corrective sensation, facilitate or provoke the hallucination; and reciprocally, company, light, conversation, aroused attention, all circumstances giving rise to or augmenting the corrective sensation, destroy or weaken the hallucination."

For a complete discussion of this subject, see Taine, Part I, Bk. II, Chap. I.

and a heavy fall of snow ; indigestion, as in an instance related, may suggest a picture of the Evil One, seated cross-legged upon the stomach of his victim, and holding Bunker Hill Monument in his lap.

### IMAGINATION.

#### 47. ILLUSTRATIONS, AND DEFINITION. CHARACTERISTICS.

I read a description of Athens or an account of the battle of Marathon, and I picture the ancient city with its temples, or the battle-field and the events of that glorious contest to ward off the Persian invader. An inventor pictures a balloon impelled by electricity and guided by the aeronaut in a direct course, and he endeavors to adjust the materials and wield the forces with which he is familiar to that end. The artist sees elements of beauty in many landscapes, and with these elements he constructs an ideal landscape. We observe admirable qualities in different persons, and with these we imagine the ideal man and perhaps endeavor to conform our lives to an ideal standard. These are typical acts of the Imagination. **Imagination is the power to modify and recombine our images and ideas.** Phantasy simply recalls, Memory recognizes, but Imagination constructs. The imagination of the reader who pictures the scenes of description may be called *Cognitive* ; the imagination of the inventor may be called *Inventive* or *Philosophical* ; the imagination of the artist may be called *Æsthetic* or *Poetic* ; the imagination which forms ideals of excellence in conduct may be called *Ethical*.

Examine each of the above examples and note the truth of the following statements,

1. The materials used by the imagination are derived from experience. We use familiar people, towns, mountains, valleys, events, qualities and experiences to construct ideals. There is no image of description, no conceived geometrical figure, no vision of the future which is not constructed out of the crude materials of memory, which has not in some way been a part of our former experience. Our percepts and any of our recalled experiences may be idealized. This material may be changed by enlarging, diminishing, adding to or taking away.

2. We think abstract and general notions, but we imagine the particular and concrete. We imagine a particular machine, or state of society, or home, or citizen.

3. The imagination is creative. It creates the plan, the grouping of the material. The plan of the architect, the ideal of the painter, the harmony of the musician, the artistic beauty of the poet, and the Universe of God are all created by the imagination.

4. Products of the imagination are called Ideals. For some products, however, the term *Picture of the Imagination* is preferable.

5. Imagination is employed in Memory. Defects of the memory are supplied by some act of the imagination, so that the past is seldom remembered just as it was.

6. Imagination is necessary to progress. The matter of perception and memory is rendered fluid and mobile by the imagination, and thus it may be changed into idealized products.

7. Doubtless the Imagination constructs in accordance with the laws of association both primary and secondary.

48. COGNITIVE IMAGINATION (54, 1). The Imagination plays an important part in the enjoyment of life and

in the acquisition of knowledge. The pleasure in a story and the vividness of its impressions depend upon the power to imagine the scenes suggested by description. In the study of Geography and History, we are obliged to imagine physical features, scenes and events. In the study of Science, descriptions of objects, specimens and experiments must supplement, to some extent, observation. By imagination space may be filled with geometrical figures to aid the study and application of the principles of Mathematics.

**49. INVENTIVE OR PHILOSOPHIC IMAGINATION** (54, 2). In practical ways the Imagination is of the highest importance to man. In the many little conveniences and contrivances of every-day life, in all sorts of experimenting, the imagination is the essential element. When the mathematician thinks out a difficult problem, his imagination leads the way, and he conceives the conditions or processes or results to be so and so, before the steps of reasoning and proof follow. So the inventor mentally places the parts of machinery in certain relations, to produce certain results, before the machine can be actually constructed and operated. "When Hargreaves upset his wife's spinning-wheel, he saw in the vertical revolving spindle the ideal of the spinning-jenny. Watt saw the steam-engine in the uplifting of the lid of a tea-kettle. Galileo saw the principle of the pendulum in a swinging chandelier." Newton, observing the law of gravitation in the falling of an apple, created in thought a solar system regulated by that law. The economist and the statesman must picture ideal conditions of society and imagine what measures might lead to desired results. The teacher must imagine excellent condi-



tions before improvement of the school can follow. Napoleon mentally fought his battles before the engagements occurred. Business men picture ideals of success, and the conditions necessary to their attainment.

**50. ÆSTHETIC OR POETIC IMAGINATION** (54, 3-4). There is another use of the Imagination involving the æsthetic emotions. All works of art, possessing an element of beauty, are the result of the poetic imagination. The architect uses the rough building materials to construct edifices of beauty and grandeur that speak to the minds and hearts of the people. The musician combines the elements of music into wonderful productions of melody and harmony. The sculptor chisels the rough marble into ideal forms of grace and strength. The painter combines scenes and figures of his observation into new relations of form and color, with a skill almost transcending nature's touch. The thoughts and images of the poet are brought into artistic relations, and we have the grandeur of Milton, the grace of Chaucer, and the wonderful creations of Shakespeare.

**51. THE ETHICAL IMAGINATION. THE PERFECT.** Every one at times pictures noble deeds to emulate, traits worthy of imitation, a character fashioned in harmony with right,—the perfect man; and every one endeavors with much or little success to conform his own life to the ideal standard. The possession of such ideals is a potent factor in regulating the conduct of men.

The Perfect in the form of Beauty, Truth and Right finds a place in the imagination of man. Ever aiming at the attainment of perfection in art and poetry, ever striving to discover truth, ever wishing to know the

right, man moves slowly onward to the realization of the highest ideals. Here man is essentially creative; here he may be thought to transcend Nature and reveal the progressive self-activity due to his divine origin.<sup>1</sup>

**52. GROWTH OF IMAGINATION (54, 5).** Children are full of imaginative activity. They constantly picture strange things, endow their playthings with human attributes, tell marvelous stories, and contrive little inventions. As their experience enlarges and their judgment ripens, the imagination, although not so luxuriant, develops in useful directions, or in accordance with the laws of good taste.

The power of imagination may be cultivated in almost any direction. The genius of the poet and that of the inventor are but different expressions of the same power to recombine the elements of knowledge.

### **APPLICATIONS.**

#### **53. PRINCIPLES OF MEMORY APPLIED.\***

1 (35). We remember readily what is apprehended clearly. By noting agreements and differences an

<sup>1</sup> "The Imagination is able to create ideals, i.e. thoughts of the desirable and perfect, as types by which to test and improve nature as well as the æsthetic, intellectual and moral achievements of man."—Dr. HAYES.

"When the higher objects of nature and spirit are recalled, recombined, and created, with the aid of the nobler laws of association, for the higher ends of ideal elevation and improvement—when, in addition, the better feelings are addressed and excited, and the higher capacities of man are called into action, then the power becomes poetic imagination."—Dr. PORTER.

\* Read Bain's Ed., Chap. III, "The Retentive Faculty."

idea is made clear and distinct. Note the common element in Phantasy, Memory, and Imagination; then contrast Memory and Imagination; the idea of each faculty becomes distinct, and its definition will be easily recalled.

2 (36). Resemblance and contrast are bonds of association in Memory. By noting the resemblance between a City-Republic of Mediæval Italy and a state of ancient Greece, the idea of either tends to recall the other. We define by contrasts. This is another statement of the fact that we know by observing differences. Contrast the eastern coast of South America with the western; the knowledge of both sections and the probability of recalling the features of either is increased.<sup>1</sup>

3 (36). By the principle of contiguity, things which are to be remembered together must be studied together, grouped in natural relations, and presented in logical order. If the relation and order be those of cause and effect, the reason will aid the memory.

4 (36). In class work, skillful questioning may bring the mind in close contact with the important relations between facts, and these relations may become bonds of association for the memory.

5 (37). Attention is the condition of memory. *Concentration* of the mental powers upon an object is the die that stamps a deep impression of it upon the mind.

6 (37). That there may be clear discrimination and distinct memory, lessons must not be too difficult or

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<sup>1</sup> For examples of resemblance and contrast see Tate, Part II, Chap. IV.

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too long; the essential facts and principles must be emphasized and frequently reviewed.

7 (37). The acquisition of new ideas makes a great demand upon the energy. We remember what is studied when the powers are fresh and vigorous.<sup>1</sup>

8 (37). The memory is aided by expressing thought. Expression brings the whole energy of attention upon the subject; hence the value of class recitation. Impressions made by the lectures of a teacher are likely to be very slight unless the pupil is required to give back the thoughts in his own words.

9 (37). What can not be acquired under favorable conditions of attention may be retained by repetition. Repetition helps to make ideas clear and well defined, and increases the probability of recall. In any case *important* ideas are to be emphasized by repetition.

10 (37). One remembers the ideas which accord with his habits, tastes, and tendencies because he finds an interest in them. Interest invites attention. Every means is to be employed to awaken an interest in studies. With older pupils, among other things the teacher may appeal to worthy motives. With your children, a responsive chord may be touched by flexibility of method which adapts itself to the individual.

11 (39). Ideas are essential; the word signs have merely a relative value. For the greater part memory should be a memory of ideas and not of words. In class work every means should be employed to test the presence of ideas in the mind of the pupil. This is emphatically true for such studies as Geometry and

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<sup>1</sup> Bain's Ed., Chap. III, pp. 22-27.

Physics. In all instruction unfamiliar words should be defined; that is, the idea for which the word stands should be gained. "Learning by heart" is often not learning at all, because the language is emphasized to the neglect of the ideas. When learning verbatim the presence of ideas will aid the verbal memory.

12 (41). It is impossible to remember everything. Select for the memory things of prime importance. The encyclopædia is a better receptacle than the mind for much matter that is frequently acquired. The mind needs power to examine the relations of the more important things. To know where to find information is of great value; this is appropriately called the *Index Memory*.<sup>1</sup>

13 (41). General principles, theories, laws, well understood, will enable us to remember the facts connected with them. Theories are appropriately called the strings upon which to arrange the beads of facts. In all studies the important things are to be fixed in mind, the large features of the landscape are to be outlined, and afterward the details can be acquired, and associated with the prominent ideas.

14 (41). Knowledge gained and forgotten is not altogether lost. By it we have corrected and added to our general impressions, although the facts may have vanished that aided in the growth of our opinions.

15 (41). The absolute memory should be employed in learning such things as gems of literature, accurate statements of important principles, and propositions in Mathematics.

16 (43). Mnemonics is a system of remembering by

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artificial methods instead of by natural and philosophical relations. Simonides, the Greek poet, who lived about 500 B.C., was the first who used this method. He pictured in mind some large building, and became perfectly familiar with the different parts in a certain invariable order. He then committed to memory by associating ideas in proper order with the parts of the building. In most cases Mnemonics is of doubtful utility. Much time is wasted in learning the system, and, after all, the knowledge is of less value than when remembered in the natural way.

17 (43). Finally, a mind well stored with ideas is prepared for the convenient and ready use of reason. The mind can thus bring into the field of view a large number of facts and build up judgments and principles in view of all the circumstances that might affect the result.

#### **54. APPLICATIONS OF THE FACTS AND PRINCIPLES OF THE IMAGINATION.**

1 (48). In teaching history and geography vivid description is of value. If the skeleton of knowledge be clothed with descriptions of persons, places, and events the interest is increased.<sup>1</sup> Familiar objects help children to image the unknown. The hills, valleys, and streams of the child's acquaintance may be used as elements with which to construct the world. A knowledge of the physical geography of a country

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<sup>1</sup> Rosenkranz emphasizes the value of pictures to represent things which can not be presented to the immediate perception. See Rosenkranz, §§ 86, 87.

On teaching geography, see Fitch, Chap. XII.

stimulates the imaginative faculty in the study of history.

2 (49). Children are naturally anxious and ready to examine the structure of things and to inquire into the causes of phenomena. There are many ways in daily life in which parents and teachers can call the attention of children to events and their causes. The methods of the Kindergarten, by little combinations and inventions, tend to educate the inventive imagination.

3 (50). Children naturally incline to the marvelous. They delight in hearing fictions. The judicious fostering of this tendency aids the constructive power of the child, which may afterward be of practical use. Burns declares that the stories, told him by his nurse, of fairies, giants, and enchanted towers, cultivated in him the latent seeds of poetry.<sup>1</sup> The tales of mythology quicken the imagination and inventive power of young people, and make the whole mind active. Indeed every variety of imagination serves to give flexibility to the mental images, and prepares the way for invention and reason.

4 (50). The love of poetry, music, sculpture, and painting not only serves for enjoyment, not only exerts a refining and ennobling influence, but it suggests ideas of perfection in execution which may lead to practical results. All ideals, from those of the inventor who aims at perfect adaptation in machinery to those of the poet and the moralist, have a practical value. Before there can be progress there must be something

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<sup>1</sup> For statements concerning the literature best adapted to children and youth, read Rosenkranz, §§ 94-97.

proposed to be done, some ideal standard to attain. A lively imagination pictures the possibilities of action and accomplishment, acts as a pioneer to lead the way.

5 (52). While the Imagination may be of the highest use in the ways indicated, the man of imagination is not always the man of action. One may learn to enjoy his fancies, may constantly picture forth possibilities and spend his time in ideal creations, when he should be closely following his ideals with action.<sup>1</sup> So the enjoyment of fine art may become an absorbing interest to the neglect of practical duties. An imaginative mind may fail in the necessary examination of facts in accordance with the principles of reason, and thus fall into serious error. But all abuse of the imagination may be corrected by restraint and the cultivation of the neglected faculties.

### EXERCISES.

1. Compare a Representative act with an act of Perception. In what does an Image differ from a Percept?
2. Illustrate the difference between Phantasy, Memory, and Imagination.
3. Show that memory is an element of perception.
4. Show that the power to discern difference and agreement is necessary to memory.
5. Give an original example of a series of associated images.

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<sup>1</sup> I have fed

Perhaps too much upon the lotos-fruits  
Imagination yields,—fruits that unfit  
The palate for the more substantial food  
Of our own land,—reality.

L. E. LANDON.



6. Give original illustrations of each of the Primary Laws.
7. Show that the "comprehensive principle" includes the four laws of association.
8. Can the four kinds of association be explained as Contiguity?
9. Illustrate each of the Secondary Laws.
10. How does language aid the formation of clear images?
11. For the purpose of committing to memory is it desirable to read or study aloud?
12. Would it aid the memory to write an outline, for instance, of a chapter in history?
13. Show by an original illustration how the idea of time may arise.
14. Is a slow memory necessarily a poor one?
15. Show that memory is not free from imagination.
16. Relate some instances of great power of memory.
17. If one were to perceive a presence in a room not visible to others, how would you explain the phenomenon?
18. Make a definition of Cognitive Imagination; of Philosophical Imagination.
19. Do we produce in imagination anything that has never been experienced? What does the artist create?
20. Give an example of each class of ideals.
21. Why is imagination necessary to progress?
22. How are sensations produced? Of what are percepts made? Of what are images made? Of what are ideals made? Give illustrations.
23. Mention some important resemblances and contrasts in Geography; in History.
24. Why will thoughts be better remembered if presented in logical order?
25. Illustrate the necessity of attending especially to the important features of any study.
26. Why is it difficult to acquire new ideas?
27. Why does vigor of body aid the memory?
28. Enumerate the advantages of class questioning.
29. In the school-room should the same methods be employed for all individuals?

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30. Make practical statements concerning economy in the use of memory.
  31. Does change of mental work rest the mind ?
  32. Describe some system of mnemonics.
  33. Is the moving of the lips in study an advantage ?
  34. Illustrate the use of familiar objects as aids to the cognitive imagination.
  35. In primary schools when may the cognitive imagination be substituted for observation ?
  36. Does Shelley's ode "The Cloud" express scientific fact as well as poetic beauty ?
  37. From a psychological view is poetry practical ?
  38. Write a brief essay on Ideals and Action.

## THINKING.

## INTRODUCTION.

**55. THE PROCESSES. DEFINITIONS.** We have learned how we gain a knowledge of objects through Perception and how we retain and recall that knowledge by acts of Memory. We have also learned that we may combine these images of the memory in new relations and build up the creations of the Imagination. We are now to consider what use we can make of these varied products of perception and representation.

We may not only see and remember a particular rose or pansy, the household dog or cat, a certain orange or apple, but we may think at the same time of many other objects of the same kind, and refer to them by a general term, as flower, animal, fruit. These general terms apply not to one object only, but to a group of objects more or less alike. So, on the ground of resemblance, the mind is accustomed to "seize on a number of things and bring them into a unity of thought," and apply to them a common name or general term. This process is called *Conception* (*con* and *capere*, to grasp together).

Our daily conversation largely consists in simply affirming a relation between objects or notions<sup>1</sup>; as,

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<sup>1</sup> By Notion is meant any product of Perception, or Representation, or Conception. It may be a Percept, an Image, an Ideal, or a Concept.

This apple is sweet, The scenes of childhood are dear, The sponge is a compound animal, The candidate is not worthy. Examine these sentences and you will see that each expresses a relation between two notions, and that in the first three sentences one notion is affirmed of the other, while in the fourth it is affirmed that the two disagree. The process described is called *Judgment*. A Judgment expressed is a *Proposition*, and the words denoting the objects or notions compared are called *Terms*.

We not only use independent judgments as in the preceding examples, but we derive judgments from other judgments, or base them upon others ; examples : It will rain because heavy clouds are in the sky ; This bar will attract iron, for it is a magnet ; Mr. Smith has cheated his creditors, therefore he is a dishonest man. In each example the judgment is based upon a reason. Sometimes judgments are derived in a more formal way ; as,

All sciences are useful ;  
Logic is a science ;  
∴ Logic is useful.

Here the judgment "Logic is useful" is derived from the other judgments. We reach the conclusion because "sciences" are contained in the class of "useful things," and Logic is reckoned among sciences. *Things which are a part of a part must be a part of the whole.* The above are examples of *Reasoning*.

The processes described and named in this section are the essential processes in Thinking. By their use the human mind advances to wonderful degrees of knowledge. Each process is only bringing into cer-

tain relations or considering in some of their parts the Percepts of our observation and the Images of Representation.

**Conception** is the process of forming a general notion of a class of similar objects.

**Judgment** is the process of comparing two notions and affirming that they agree or disagree.

**Reasoning** is the process by which judgments are inferred.

**Thinking** is the series of processes by which our Perceptive and Representative knowledge is arranged. It includes Conception, Judgment, and Reasoning.

The product of Perception is a Percept; the product of Memory is an Image or Idea; the product of Phantasy is a Phantasm; the product of Imagination is an Ideal or Picture of the Imagination. These products are elaborated by Conception, Judgment, and Reasoning. The product of Conception is called a Concept; the product of Judging is a Judgment; the product of Reasoning is an Inference or a Conclusion.

**56. THINKING CONSIDERS RELATIONS.**<sup>1</sup> Note that, while Presentation and Representation deal with objects, Thinking deals with the *relations* of objects. The objects of a class are bound together by the relation of similarity; a group of red objects are related in point of color. Judgments affirm the relation of agreement or difference; "The day is rainy" expresses an agreement of this day with rainy days, "This coin is not good" points to a difference between the counterfeit coin and coins of true metal. Reasoning discovers relations of agreement and difference, not by

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<sup>1</sup> Read Bain, Bk. II, Chap. II, p. 148.

direct comparison of two objects, but by comparing each object with a third.

Thinking deals with relations; these are relations of Agreement and Difference.

### CONCEPTION.

**57. THE PROCESSES. THE CONCEPT.** The student in Botany begins the study of leaves; he makes a collection of many kinds and *observes* them. By *comparison* he notes that some are netted-veined, while others are parallel-veined. He desires to separate the netted-veined leaves from the rest, and he *abstracts*, that is, draws off the characteristic, netted-veined, and considers it apart from other qualities, as shape and color, —in other words, he views the leaves with reference to this characteristic. Having selected all possessing the quality named, he *generalizes*, that is, he applies to the whole group the quality netted-veined; it is general to the group. Having formed this Group-Notion or *Concept* he *names* the group "Netted-Veined Leaves." In his mind this name stands for the Concept and, when used, suggests the same concept to another.

The processes in Conception are Observation, Comparison, Abstraction, Generalization, and Naming.

When we use a general term what mental state does it represent? What reality is there corresponding to the term "netted-veined leaf," "animal," "fruit," "flower"? This has always been a source of much metaphysical discussion,<sup>1</sup> but let us try an

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<sup>1</sup> "Universals [concepts] are (1) *objective relations of resemblance* among objectively existing things; (2) *subjective concepts*

experiment for ourselves. When I use the word flower, perhaps the image of some flower, no definite one, arises in the mind, an object with colored petals, seed-producing, etc.; or I may have in mind a definite flower, as a rose; or a series of images of different flowers may flit through the mind. In any case there is some kind of image and this image stands as a type of the whole class of objects named. But only those qualities of the image which are common to the whole class are regarded as essential, and the image is regarded as typical. These common qualities of the typical image constitute the concept. **A Concept is a combination of qualities, common to several objects, in a unit of knowledge; "it is a notion of objects grasped together by common properties."** Dogs, birds, horses, men,—all animals, are grasped together by the common properties—moving, breathing, eating. An animal is a thing that moves, breathes, and eats.

**Abstract notions are concepts.** The notion "red object" and also the abstract quality "redness" are concepts.

**58. GROWTH OF THE POWER (88, 89).** The power to form concepts is shown by children in their attempts to apply the name of a familiar object to one similar in appearance. Having learned to recognize and name the horse, a kind of resemblance is discovered when the same name is applied to a cow. A child less than two years old, having its attention called to the moon,

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of these relations, determined in the mind by the relations themselves; and, (3) *names*, representative both of the relations and the concepts, and applicable to them both."

For views of the nature of concepts, see Porter, p. 408.

afterward called a large bright seal on a parchment "moon." Children often invent some word for the various kinds of food. In an instance observed the syllable "*num*" was used for whatever was good to eat, and an increase of power was shown by the use of an appended adjective, making "*num poo*" stand for whatever was good to eat with a spoon. So far there is no conscious power of abstraction, but an almost instinctive recognition of crude resemblance. In the instance related the child could in no way have been made conscious that roundness was the quality common to the moon and the seal.

The power of forming general notions and applying general terms grows rapidly, until one class of domestic animals may be correctly distinguished from another, and other familiar objects may be grouped and named. The power of abstraction has developed to a considerable degree when the child, if directed, is able, for instance, to point out all the red or white or round objects in a room. It can then understand, in a way, that redness, or whiteness, or roundness is the quality binding the objects together.

The power of savages to classify is in some ways about as crude as that of children. The classifications of the uneducated are usually very imperfect. One of the advantages in the study of Natural History is the training of the power to form general notions.

**59. SCIENTIFIC CLASSIFICATION.** Conception has been defined as the process of forming a general notion of a class of similar objects. Classification is the process of forming groups of similar objects. Classification is the actual grouping; conception is forming a notion of the group. The natural groupings of objects of

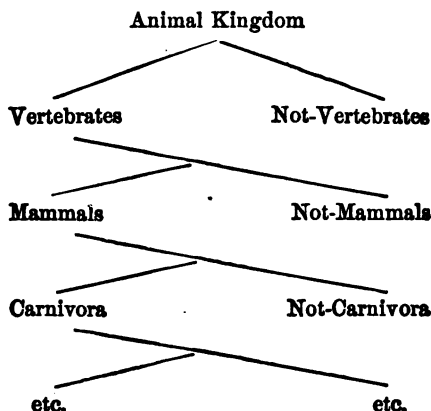


common observation and the classifications of the scientist are similar, but the scientist carries the process farther and makes it more logical and accurate. The Zoölogist includes under the Animal Kingdom, living things which subsist on organic food, breathe oxygen, and have the power of voluntary motion. Thinking of different kinds of animals, he finds some that have an internal jointed skeleton, and calls them the Branch of Vertebrates, excluding all which do not possess the characteristic mentioned. Calling the characteristics or *marks* of the Kingdom  $a$  and that of the Branch  $b$ , evidently the Vertebrates are known by the marks  $a + b$ . Amongst the Vertebrates he finds some that suckle their young, and calls them the Class of Mammals. Mammals, then, are distinguished by the marks  $a + b + c$ . Amongst the Mammals some are known as the Flesh-eaters, and are grouped into the Order of Carnivora, possessing the marks  $a + b + c + d$ . And so the process may be continued by dividing the Order into Families, each family into Genera, each genus into Species, each species into Varieties, until the Individual is reached, possessing marks enough to distinguish it from every other animal.

The greatest danger in classifying is that of forming "Cross-Divisions." If we should attempt to classify all animals as domestic, winged, and Australian we should fall into this error. In this instance the division is begun on the principle of domesticity, continued on the principle of structure and again on the principle of location. Each of these divisions overlaps the others. The Zoölogist proceeds in his divisions of the Animal Kingdom on the principle of

essential structure. Each division should be made with reference to but one principle.<sup>1</sup>

DIAGRAM SHOWING PROCESS OF DIVISION.



NAMES USED IN CLASSIFICATION IN ZOOLOGY.

Kingdom  
Branches  
Classes  
Orders  
Families  
Genera  
Species  
Individuals

Without the power to classify, progress in knowledge would be almost impossible. We should be obliged to learn the nature of every object which we might encounter, although we might have become familiar

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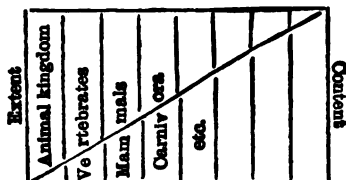
<sup>1</sup> For the rules of Division, see McCosh, *Logic*, p. 39.

with a thousand similar objects. With the power to classify, the essential knowledge of one object may be applied to numberless ones of the same kind. When we have learned the marks by which a class is distinguished, the bare recognition that an object belongs to that class may suggest much incidental knowledge. The mark by which a triangle is distinguished is its three-sidedness: the moment we know a figure to be a triangle, we may also know that any side of the figure is less than the sum of the remaining sides, and that the sum of its angles is equal to two right angles. When we place an animal among the Carnivora, we immediately know that its teeth are adapted to tearing and cutting. The Botanist, thoroughly acquainted with the chief characteristics of the common families of plants, when he recognizes a member of the Rose family, knows that its fruit is not noxious; when he locates a plant in the Nightshade family, he thinks that its fruit is probably poisonous. In like manner the farmer forms two classes of sky indications, fair and foul; with one class of indications he expects rain and takes measures to save his harvest.

By the power to classify, we know many things through one thing, and we apply our knowledge of one thing to many things.

**60. CONTENT AND EXTENT.** Referring to the example in section 59, evidently the concept, *animal*, includes only the marks *a*, but it includes all the animals in the world. The concept, *Vertebrates*, includes the marks  $a + b$ , but leaves out all animals not possessing the marks *b* in addition to *a*. The characteristics, attributes or marks of a concept are called its *Content*;

the number of individuals included is called its *Extent*. As the division descends the *Content* increases, but the *Extent* decreases.



**61. USE OF LANGUAGE IN THINKING.**<sup>1</sup> Language is indispensable to progress in thinking. When objects are grouped by their similarities, it seems necessary to label the group with a name, that it may afterward

<sup>1</sup> Read McCosh, *Logic*, pp. 53-70.

Prof. Max Müller claims that thought and language are inseparable, that thought is impossible without words, and that first names are names of concepts and not of individuals. His view of the relation between thought and words is commonly rejected. According to this author our treasury of words is all derived from the 1000 roots of the Aryan language and the 121 primitive concepts of Aryan thought.

"But if there is no such thing as a mere name, neither is there such a thing as a mere thought or a mere concept. The two are one and inseparable. We may distinguish them as we distinguish the obverse from the reverse of a coin; but to try to separate them would be like trying to separate the convex from the concave surface of a lens. We think in names and in names only."

"Now what does the Science of Language teach us? It teaches, what can not be repeated too often, that all names were originally both abstract and general, and that it was impossible that they could have been anything else. Thus in analyzing, for instance, the name of wolf, Sk. *v r i k a*, we found that it was derived from a root *VRASK*, to tear, to lacerate, and meant, therefore, originally no more than 'a tearing thing.' The name for animal, for instance, meant originally no more than a thing that breathes, animal being derived from *anima*, and *anima* from a root *AN*, to breathe."

be held together in the mind and known. Without these word signs our conception of classes would be confused and limited.

In processes of Judgment and Reasoning, the comparing of notions is facilitated by the use of auditory and visual signs, namely, the words representing those notions and their relations. Through language the relations between notions become more definite as objects of knowledge. By the use of language the atoms of thought become crystallized into definite forms. We can imagine how meager our knowledge of Mathematics would be if we could compute only by using a large number of objects, as sticks or balls. But when figures, letters and signs are used, each standing for some fixed quantity or relation, progress in knowledge of numbers is easy. By these signs each step of reasoning is fixed and the mind is left free to move forward to new discovery. A word may help to develop a concept that almost or quite goes beyond the power of imaging, as *virtue*, *infinity*, *a million*.

Perhaps we find at times that language is inadequate to express our thoughts and feelings, and so our experience is never clearly defined by ourselves, and never communicated to others.

**62. ABUSE OF WORDS.<sup>1</sup> CLEARNESS OF CONCEPTS<sup>2</sup>** (90, 91). When we consider that children learn many words before they have a knowledge of the things for which they stand, that adults often learn the use of words in a mechanical way without concerning themselves about the exact notions which the words should

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<sup>1</sup> Read Locke, Bk. III, Chap. X ; also McCosh, *Logic*, pp. 70-78.

<sup>2</sup> Read Locke, Bk. III, Chap. XI ; also McCosh, *Logic*, pp. 78-83.

represent, that words are applied loosely, sometimes in one way and sometimes in another, that our knowledge of a thing is frequently incomplete and inaccurate, that one man looks at a subject from one standpoint, and another from a different point of view, we can not wonder at the confusion and misunderstanding that often arise in the communication of thought. **Inaccurate concepts, imperfect definition of words, and difference in use of words are the occasion of confusion in the use of language.**

The word *Idea* is sometimes confined in its meaning to Image, sometimes it means both Image and Concept; by metaphysicians it is given two meanings, each differing from the other and from the meanings just mentioned. Think of the word *church* and learn how many applications it may have. The word *clever* as used in England and in the United States conveys very different ideas. Many who use the expressions would find it difficult to tell what they mean by *Centralization of Power*, or *Conservation of Energy*. Men by their conduct often show that they confound *liberty*, which means not only freedom for one's self but non-interference with the rights of others, with *license*. Two men may argue fiercely for hours without even talking to a common point, because one has one notion in the mind answering to a given term, and the other a totally or partly different notion.

That we may avoid errors in the use of words, clear concepts are necessary. To possess clear concepts and to be able to illustrate with concrete examples,—this is the important rule. In the use of abstract terms there is the greatest tendency to vagueness. We should practice filling every empty word with

meaning. A word which goes utterly beyond our experience and definite conception is an empty sound. What is called precision in the use of words, giving them neither more nor less than well established usage allows, is next in importance. To this end the habit of defining words by the aid of the dictionary is necessary. In argument, whenever a misunderstanding arises, a definition and illustration may be sought by common consent. *Loose methods of thinking may be corrected in part by rigid practice in forming clear concepts, and in correctly defining the use of words.*

#### JUDGMENT.

##### 63. NATURE AND GROWTH OF JUDGMENT (88, 89).

Judgment is the process of comparing two notions and affirming that they agree or disagree.

I discern that sodium possesses the qualities which belong to metals, i.e. that the two things agree, and I affirm the agreement "Sodium is a metal." I discern a disagreement between carbon and metals, and affirm the disagreement "Carbon is not a metal." These are judgments.

The Judgment is early developed; this is seen in such expressions of the child as "sugar good," or simply "good," two notions being virtually compared. The power grows rapidly, and soon simple remarks are freely made about familiar objects and experiences. Any more noticeable quality or phenomenon connected with an object awakens an intuitive judgment in the mind of the child that the quality belongs to the object, and he expresses it; as, "The ball is white;" "The fire is hot."

**64. BELIEFS.** When a judgment expresses a real, a truth-relation, or when it so appears to us, we believe it. **Belief is assent to a proposition, a regarding it as true.** (1) Some beliefs are founded upon necessity. We learned under Perception a limited list of Necessary Ideas. Certain truths expressed about these Ideas are called **Necessary Truths**<sup>1</sup> and we must believe them. The following are examples of Necessary Truths :

Necessary Ideas.	Necessary Truths.
<b>Being</b> . . . . .	Objects exist or have being.
<b>Cause</b> . . . . .	Every event has a cause.
<b>Space</b> . . . . .	Space has no limit.
<b>Time</b> . . . . .	Time is continuous.
<b>Number</b> . . . . .	Things equal to the same thing are equal to one another.
<b>Resemblance</b> }	Whatever is true of a class is true of all the members of a class.
<b>Difference</b> }	

(2) We are naturally disposed to accept the statements and opinions of others as true. (3) Our desires and prejudices often influence us toward certain beliefs because those beliefs are agreeable. (4) We gradually grow into many beliefs through experience. These statements do not include belief in the conclusions which are reached by formal processes of Logic. **Beliefs are based upon Necessity, Opinion of others, Inclination, and Experience.**

Our prejudices play too important a part in the formation of our beliefs, or, at least, in the unguarded expression of hasty opinions. We are likely to regard people as they may happen to affect us. A little delicate flattery will incline us to think well of a per-

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<sup>1</sup> For a brief account of necessary truths see Appendix.



son who may be unworthy, while an unpleasant experience in some unimportant matter will lead us to judge ill of the person's essential character. A judicial mind, one that will seek out and weigh the essential facts, without reference to personal like or dislike, is one of the attainments of a well-balanced and generous character.

Experience is the ground of most of our beliefs. When a sailor believes that a storm will come, he bases his belief on his experience with certain indications; we believe that we shall die because of the experience of mankind in the past. Faith in the continued existence of nature and the uniform operation of her laws results from experience.

**65. TERMS.** Before passing to the discussion of Judgments or Propositions, it is necessary to know something of terms. Objects of thought have names by which they are known. In Logic these names are called *Terms*. A term may consist of one word, as "book," or of several words, as "The President of the United States." A term may be an adjective, standing for some quality as "hard," "transparent."

Amongst terms we find some referring to single things, as "The inkstand," "Bunker Hill Monument," "America." **Names of single things are called Singular Terms.** Other names refer to classes of things, as "plant," "citizen," "house;" each of these names may be applied not only to one thing but also to very many things of the same kind. **Names which are common to many things are called General Terms.** When I say "United States Navy," I am using a singular term, because it refers to a definite thing, that is, the war vessels of the United States regarded as a unit; but

the term is also Collective, because many vessels are included. The term "navy," however, is general, because it may be applied to the war ships of any nation; the term is also Collective. The name of many things regarded as a unit is a Collective Term. Singular Terms and General Terms may also be Collective.

Some names are applied to objects, as "tree," "gold;" others to characteristics, as "height," "ductility." The names of things are called Concrete Terms; the names of qualities, Abstract Terms.

Some terms express the existence of qualities, others indicate the absence of certain qualities; examples: "desirable," "undesirable;" "placable," "implacable;" "voluntary," "non-voluntary;" "acquaintance," "non-acquaintance" or "stranger." Names which express the existence of qualities are called Positive Terms; names which indicate the absence of certain qualities are called Negative Terms.

What kind of a term is each of the following?—The Cæsars; The Emperor of China; Ingratitude; Rational; Library; The Museum of Natural History; Goodness; Stone; Friendly; Non-conformity; A Thousand; Citizen; School.

**66. THE PROPOSITION, ANALYSIS OF.** Judgments expressed are called Propositions. Examining some proposition, as "Books are useful," we discover two terms, "books" and "useful," and a verb called the *Copula* serving to affirm the relation between the things denoted by the terms. The first term, denoting that about which something is said, that which is compared, is called the *Subject*, and the last term, denoting that with which the subject is compared, is called the *Predicate*. Every proposition contains three elements,—

two terms and a copula. The first term in a proposition is called the subject, and the last the predicate.

Some propositions seem to contain more or less than these three elements, as "The man speaks," "*monet*," "To live uprightly is the duty of man." In the first example, the verb "speaks" contains both copula and predicate, and the proposition may be expressed, "The man is speaking." The Latin verb "*monet*" contains a complete judgment which may be expressed, "*ille est monens*," he is advising. In the last example, "to live uprightly" expresses but a single notion and is the subject; "duty of man" is the logical predicate.

**67. CATEGORICAL, HYPOTHETICAL, AND DISJUNCTIVE PROPOSITIONS. KINDS OF CATEGORICAL PROPOSITIONS.** The propositions used above are *Categorical*, i.e. stated positively or unconditionally; as, "Iron is the most useful metal." There is a class of propositions in which the assertion is made, subject to a condition; as, "If men are wise, they will do right." This is a *Hypothetical* proposition. The condition is called the *Antecedent*, and the conclusion the *Consequent*. Again, propositions may contain several alternatives among which we may select; we must choose one or more of the alternatives, but not all the alternatives can be true at the same time. Example, "A function of the United States Government is either legislative or executive or judicial. "This kind of proposition is called *Disjunctive*.<sup>1</sup>

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<sup>1</sup> The subject of a disjunctive proposition is regarded as the genus, and the members of the predicate constitute the species. The species must make up the genus, and the members must be mutually exclusive.

Logicians classify Categorical propositions according to *Quantity* as *Universal* or *Particular*, and according to *Quality* as *Affirmative* or *Negative*. Making cross-division of these classes, we have four kinds of categorical propositions which are commonly designated by the letters A, E, I, O, each letter invariably representing the same kind of proposition. This may be seen in the following arrangement:

**A, Universal Affirmative;** example, "All fixed stars are suns."

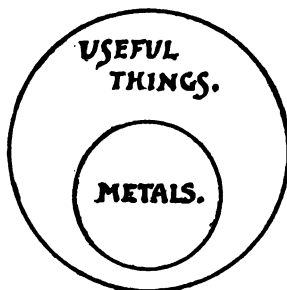
**E, Universal Negative;** example, "No work of man is enduring."

**I, Particular Affirmative;** example, "Some men are selfish."

**O, Particular Negative;** example, "Some men are not selfish."

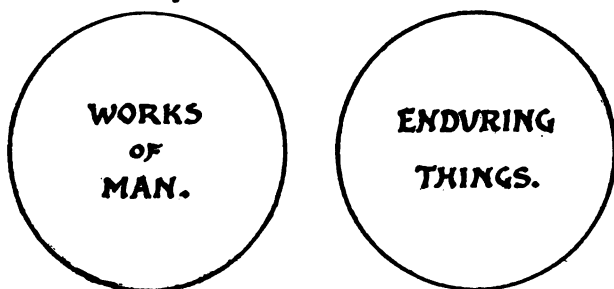
**68. DISTRIBUTION OF TERMS.** It is necessary to learn when a term is said to be distributed. Using the scheme of circles employed by the mathematician Euler, let us examine each kind of proposition with this view.

In the *Universal Affirmative*, as "All metals are useful," the relation of the terms may be expressed graphically thus:



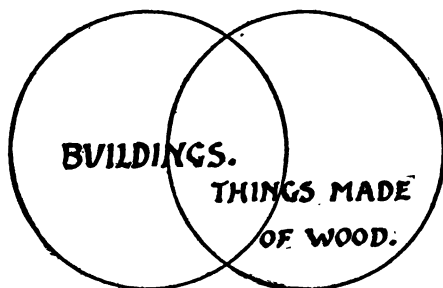
The larger circle includes all "useful things," and the smaller all "metals." The subject "metals" is *Distributed*, because something is said of every metal ; it is asserted of every metal that it belongs to the class of useful things. It would be absurd to say conversely, "All useful things are metals;" there are numberless useful things of which nothing is said, hence the predicate is *Undistributed*.

Taking an example of the *Universal Negative*, "No work of man is enduring," evidently the subject is *Distributed*, since something is said of every work of man, namely, that it is not enduring. Examining the predicate, we see that every "enduring thing" is shut out from the class of things "made by man;" hence the predicate is *Distributed*. Subject and predicate in this case are mutually exclusive. It is predicated that no work of man can be enduring, and that no enduring thing can be a work of man. The relation of the terms may be thus shown :

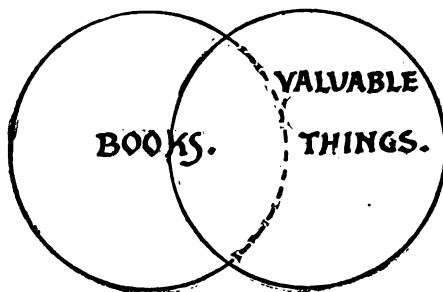


If we say, "Some buildings are made of wood," *Particular Affirmative*, there are other buildings of which nothing is said, and there are other things made of wood of which nothing is said ; hence neither term is distributed. Here the relation of the circles shows

that some buildings belong to the class of things made of wood, but that there may be other buildings, constructed of some other material, of which nothing is said.



In the *Particular Negative* proposition, "Some books are not valuable," nothing is said of the whole class of books; hence the subject is *Undistributed*. But it is stated that the whole class of "valuable things" is excluded from the class of "some books;" hence the predicate is *Distributed*. Drawing the circles and placing the class of "some books" outside, as excluded from the class of "valuable things," and all remaining books inside, using a dotted arc to indicate that no statement is made about them, we have the following:



To sum up :

**A, Subject Distributed ; Predicate Undistributed.**

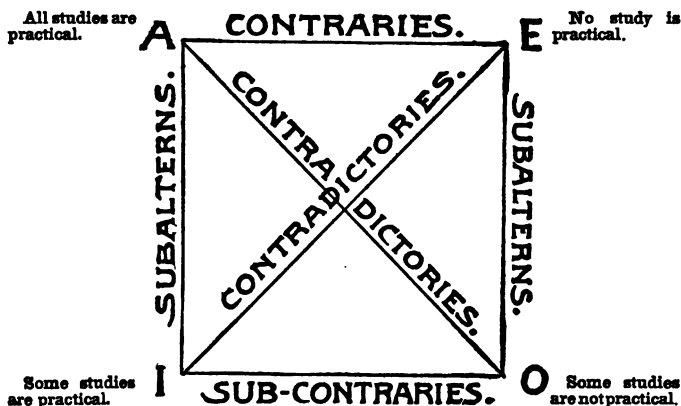
**E, Subject Distributed ; Predicate Distributed.**

**I, Subject Undistributed ; Predicate Undistributed.**

**O, Subject Undistributed ; Predicate Distributed.**

**69. IMPLIED JUDGMENTS.** From the relations of the four kinds of propositions, if they refer to the same subject, inferences may be drawn. Also, immediate inferences may be drawn from any proposition without a formal process of reasoning, inferences which are implied in the truth of the proposition.

**Opposition.** The relations of Opposition are shown by the following diagram employed by logicians :



Concerning these relations the following statements may be made :

1. *Contrary Opposition.* If it is true that "every study is practical," it is false that "no study is practical;" if it is true that "no study is practical," it is false that "every study is practical." Both statements may be false, and probably are in this case, for some studies may be practical and others not. **From the truth of A we infer the falsehood of E, and vice versa.** Both A and E may be false. Considering the *Sub-Contrary relation*, it may be true that "some studies are prac-

tical," at the same time that it is true that "some studies are not practical." If I can prove it false that "some studies are practical," it must be true that "some studies are not practical," and *vice versa*. I and O may both be true. By proving the falsehood of either, the truth of the other is established.

2. *Subalternation*. In like manner we may form a rule for subalterns. From the truth of A or E we infer the truth of I or O. If I or O is false, A or E is false.

3. *Contradictory Opposition*. If A or E is true, the corresponding Contradictory O or I is false, and *vice versa*. If A or E is false, the corresponding Contradictory O or I is true, and *vice versa*.

One or two practical remarks upon the *Rules of Opposition* may be made. We may prove a statement directly, or, as often in Geometry, we may establish the truth of a proposition by proving the falsehood of its contradictory. In argument it is useless to make issue with contrary propositions; as: Aff.—"All labor organizations are harmful;" Neg.—"No labor organization is harmful." The disputants should face each other in this way: Aff.—"All labor organizations are harmful;" Neg.—"Some labor organizations are not harmful,"—when a conclusion may be reached.

**Conversion of Propositions.** From the proposition A, "All diamonds are valuable," it may be inferred that "some valuable things are diamonds." Observe that here a limiting word is prefixed to the former predicate, "valuable," in order that the converted statement may be true. **When conversion of a proposition requires the use of a limiting word, it is called Conversion by Limitation.** A and E may be thus converted.

From the proposition E, "No scientific theory is perfect," we have, by conversion without change, "No perfect thing is a scientific theory." From the conversion of I, "Some scientific theories are perfect," we have, "Some perfect things are scientific theories." **When a proposition is converted without change of form, the process is called Simple Conversion.** E and I may be thus converted.

To suit the character of the Particular Negative proposition O, a special method of conversion is necessary; example, "Some



citizens are not law-abiding." We cannot change this by simple conversion, for it would then read, "Some law-abiding persons are not citizens." But, by attaching the negative to the predicate instead of the copula, we have a legitimate conversion, "Some not-law-abiding persons [law-breakers] are citizens." **When conversion is effected by attaching the negative to the predicate and then transposing the terms, the process is called Conversion by Negation.**

**Addition of Subject and Predicate.** By prefixing a subject and a predicate to the terms of a proposition, a new proposition may be derived; example, "London is the largest city of England," hence "The Mayor of London is mayor of the largest city of England."

**Addition of Marks.** Judgments may be inferred by modifying both subject and predicate of a proposition; example, "America is a free nation;" modified, "America in her prosperity is a free nation in prosperity." This method of inferring judgments must be made with care, else it will lead to ridiculous conclusions. From the fact that a rat is an animal it does not follow that a large rat is a large animal.

**Privative Conception.** By this method we change an affirmative proposition to its equivalent negative, or a negative to an affirmative. Examples: "All true friendships are enduring;" "No true friendship is fickle." "Not all pious men are sincere;" "Some pious men are insincere."

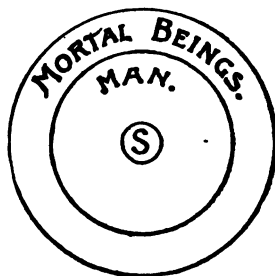
**Importance of Studying Implied Judgments.** In the study of Implied Judgments we derive benefit by examining a statement from the standpoint of both terms, also by realizing what is implied by statements in their relations of "opposition." A knowledge of the principles of Implied Judgments may often aid in the study of the syllogism, since we may thus detect the real character of obscure propositions. In short, knowledge is often gained by viewing a subject in every light.

REASONING.

INTRODUCTION.

**70. NATURE OF REASONING.** Reasoning is the process by which Judgments are inferred. There are two methods of reasoning, *Deductive* and *Inductive*. Example of the first:

All men are mortal;  
Socrates is a man;  
∴ Socrates is mortal.



Here "Socrates" and "mortal beings" are compared by means of a middle term, "man;" hence **Deductive Reasoning** is an act of Judgment by a mediate process. The form of reasoning shown in the example is a *Syllogism*. A **Syllogism** is an argument according to regular form. Example of Induction:

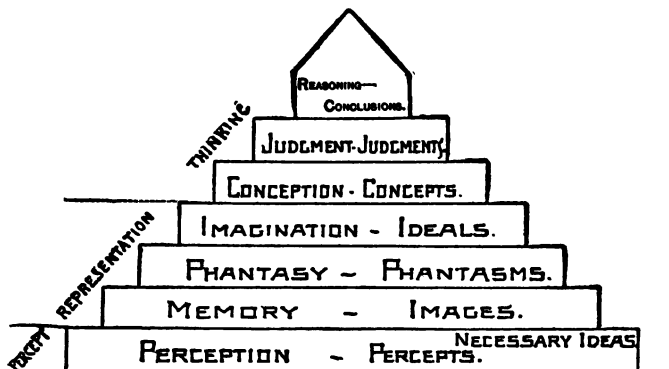
*A*, *B*, and *C* [men of former generations] were mortal;  
*A*, *B*, and *C* represent mankind;  
∴ All men are mortal.

**Inductive reasoning** is the process of inferring general judgments from particular instances. It will be noted that the conclusion of the Induction becomes the general proposition of the Deduction. By induction we infer generals from particulars; by deduction we

infer particulars from generals. Induction elaborates principles; deduction applies them. The relation between Induction and Deduction may be seen in the diagram.



Perception gives us the crude materials of thought; Memory retains them; Imagination modifies them; Conception groups them; Judgment expresses relations between them; Reasoning elaborates them to discover and apply principles. We may now use a device sometimes employed and construct the Knowledge Pyramid.



Reason is the cap-stone of the Pyramid. Reason is the crowning power of the Intellect. Reason enters into all intellectual processes: it infers causes in Perception, it tests the Memory, it approves Ideals, it helps construct Concepts, it proves Judgments.

Reason controls the Emotions and guides the Will. It discloses the laws of mathematics, discovers causes in science, establishes principles and constructs philosophical systems. By it the world is brought into unity of thought and the plan of the Creator is revealed.

**71. GROWTH OF REASONING** (88, 89). Sully relates of a child 21 months old: "His father told him not to eat some brown sugar which he was taking out of a bag. He answered promptly and emphatically, 'Ni!' This was clearly finding a reason by way of justification.—'I eat it because it is nice.'" At an early age the child is ever seeking the *why*, and is unconsciously trying thus to develop its reasoning power. The child in avoiding the fire does so because he has learned that fire burns, and he infers the result of a repetition of the experience. When a child, on hearing the remark that it will rain, immediately begins to cry and exclaims that he cannot go to see his playmate, he has drawn a hasty inference from the experience that he is not allowed to go out in the rain. The reasons of every-day life are often very incorrect or frivolous, but many sound conclusions are reached, even by the uneducated, which are drawn from the experience of years. We hear men expressing convictions upon the most important points with confidence; as, "A republic is the best form of government;" "Labor organizations are beneficial;" "A double money standard is desirable;" and, if urged, they would be able to give reasons for their beliefs, showing a substantial process of thinking. There is a certain quickness of judgment often called *tact*, which, without any apparent process

of reasoning, takes in at a glance the features of a case and reaches correct conclusions.

**72. USE OF LOGIC.** Since men reason naturally without regard to set forms, and reach wise conclusions, what is the use of logic? We might ask, "Since many uneducated people reason correctly about phenomena of the physical world, why study the science of Physics?" An acquaintance with general principles and laws, and the power to detect common errors, are an advantage in any field of knowledge. The mind, in reasoning, acts according to laws, and it is the work of the Logician to discover and express them. From an ignorance of these laws people, in their crude attempts to reason, often fall into errors. We may express the chief advantages of Logic briefly thus: It acquaints us with the laws of the mind in correct reasoning, hence men find it a valuable instrument in the pursuit of knowledge; it enables us to detect error in our own reasoning and that of others; it is in itself a valuable training for the mind. The essential principles of Logical Reasoning follow.

#### DEDUCTIVE REASONING.

**73. NATURE AND FORM OF THE SYLLOGISM. CANONS.** In syllogistic reasoning an inference is drawn by comparing two terms through the medium of a third, called the Middle Term. The following is an example of a formal Syllogism:

*Major Premise*—All sciences (*Middle Term*) are useful;

*Minor Premise*—Logic is a science (*Middle Term*);

*Conclusion*—Logic (*Minor Term*) is useful (*Major Term*).

Here the two terms "Logic" and "useful" are compared with the common term "science;" these terms are found to agree with the middle term and hence are said to agree with each other; this fact is stated in the Conclusion, "Logic is useful." The subject of the conclusion is called the **Minor Term**; the predicate of the conclusion is called the **Major Term**; the term with which the major and minor are compared is called the **Middle Term**; the proposition containing the major term is called the **Major Premise**; the proposition containing the minor term is called the **Minor Premise**; the inference is called the **Conclusion**.

The principles regulating syllogistic reasoning are called the *Canons of the Syllogism*. In the syllogism given we see that the whole class of "sciences" are declared to be "useful," and that "Logic" is affirmed to belong to the class of "sciences;" hence we conclude that "Logic is useful." We may infer the following: **First Canon: Whatever is affirmed of a class may be affirmed of all the members of that class. Whatever is denied of a class may be denied of all the members of the class.** To show the need of stating the same principle in another form to meet some cases the following syllogism may be used:

That which revolves around the earth is its satellite;  
The moon is that which revolves around the earth;  
∴ The moon is its satellite.

Here "satellite" and "moon" are each equivalent to "that which revolves around the earth." **Second Canon: Notions equivalent to one and the same third notion are equivalent to one another. Two notions one of which is equivalent and the other not equivalent to one and the same notion are not equivalent to one another.**

**74. RULES OF THE SYLLOGISM.** The following rules of the Syllogism, old as Logic itself, must be carefully studied.

**I.** Each syllogism has three terms, neither more nor less.

**II.** A syllogism must contain three propositions and no more than three.

**III.** The middle term must be distributed in one of the premises.

**IV.** No term must be distributed in the conclusion which has not been distributed in one of the premises.

**V.** From two negative premises no conclusion can be drawn.

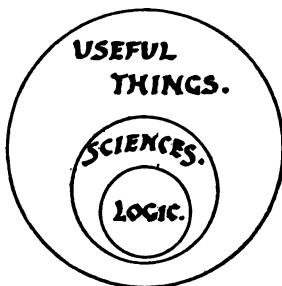
**VI.** If one premise is negative, the conclusion must be negative.

**VII.** From two particular premises no inference can be made.

**VIII.** If one premise is particular, the conclusion is particular.

Let us examine the syllogism in section 73 and see whether, according to these rules, it is valid. There are three terms, "Logic," "useful," and "sciences," and three propositions; thus Rules I and II are observed. Examining the middle term, "sciences," we see that it is distributed in the major premise, since it is the subject of a Universal Affirmative; it is not distributed in the minor premise, since it is there the predicate of a Universal Affirmative,—but one distribution of the middle term is sufficient; hence Rule III is observed. In the conclusion, which is a Universal Affirmative, the term "Logic" is distributed and the predicate "useful" is undistributed. In the minor premise "Logic" is also distributed, being the subject of *A*. In the major premise, "useful" is undistributed

as being the predicate of *A*; hence there is no violation of Rule IV. With reference to Rule VII, both premises are universal. That the remaining three rules are not violated is evident at a glance. Therefore we conclude that the syllogism is perfectly valid. This fact may be shown also by using circles. "Sciences" are included among "useful things;" "Logic" is included among "sciences;" hence "Logic" is contained amongst "useful things."



Violations of these rules of the syllogism are called Formal or Logical Fallacies. It is necessary to consider some of the more common Logical Fallacies. The rules of the syllogism will be taken up in order.

I. That there may be only three terms in a syllogism is evident from the fact that the essential method of the syllogism is the comparing of two terms with each other by means of a third. The rule is violated in the following example used by Dr. McCosh:

Every one desires happiness;  
 Goodness is happiness;  
 ∴ Every one desires goodness.

Here are five terms: "every one," "desirous of happiness," "goodness," "happiness," "desirous of goodness;" hence the conclusion is not valid. This is called **Fallacy of more than Three Terms**. Other fallacies which may be explained as violations of Rule I are *Fallacy of Equivocation* (including *Fallacy of*



*Ambiguous Middle*), *Fallacy of Composition*, *Fallacy of Division*.

As an example of **Fallacy of Equivocation** we may use the following:

All metals are elements;  
Pewter is a metal;  
∴ Pewter is an element.

The middle term "metals" is used in the major premise in the scientific sense; in the minor premise it is used in a general sense; hence there are really four terms and no conclusion can be drawn. A trivial illustration of equivocal middle term is this:

Light is contrary to darkness;  
Feathers are light;  
∴ Feathers are contrary to darkness.

**Fallacy of Composition** is shown in the following:

All legislators are very likely to err;  
The U. S. Senate is a body of legislators;  
∴ The U. S. Senate is very likely to err.

Here the conclusion may be true independently, but it cannot be drawn from the premises, because there are really four terms. The term "all legislators" is used distributively, meaning "any one legislator," while the term "body of legislators" is collective. Evidently there is not the same probability that a body of men will err as that any individual of the body will fall into error.

**Fallacy of Division** is thus shown:

The citizens of the town are prosperous;  
A and B are citizens of the town;  
∴ A and B are prosperous.

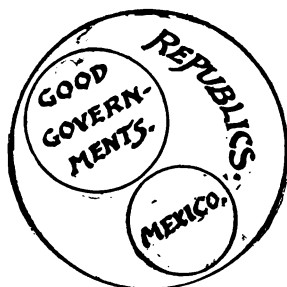
In this case the term "citizens" in the major premise is used collectively, while in the minor premise it is used distributively and no conclusion can follow. Again, there are really four terms in the syllogism.

II. The second rule hardly needs illustration. Since there are three terms in a syllogism, one proposition is needed to compare the major term with the middle, one to compare the minor term with the middle, and one to assert the relation between the major and the minor. Thus only three propositions are required.

III. Violation of Rule III is called **Fallacy of Undistributed Middle.**

All good governments are republican;  
Mexico is a republic;  
∴ Mexico has a good government.

The middle term is predicate of an affirmative proposition in both premises, and hence is not distributed. The conclusion is not valid. This may be shown by the following diagram :



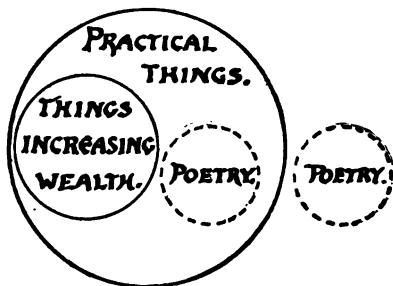
In the major premise no assertion is made concerning all republics, for there may be republics not having a good government to which class Mexico may

and does belong. Mexico must be within the large circle, but not necessarily within the circle of "good governments."

IV. Any violation of Rule IV is called **Fallacy of Illicit Process of Major or Minor Term**. Here follows an illustration of this fallacy:

Whatever directly increases wealth is practical;  
 The study of poetry does not directly increase wealth;  
 ∴ The study of poetry is not practical.

The major term "practical," being predicate of an affirmative, is not distributed in the premises, but is distributed in the conclusion, because it is predicate of a negative proposition.



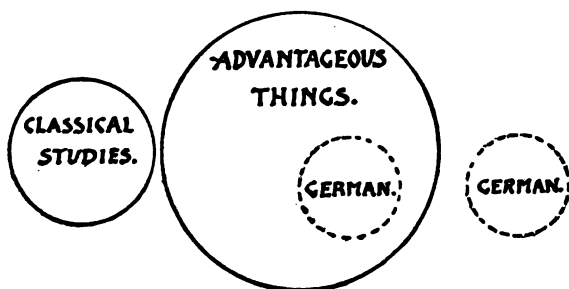
The circle of "things directly increasing wealth" is predicated to be contained within the circle of "practical things," while "poetry" is predicated simply not to be contained within the circle of "things directly increasing wealth." It may be contained in the circle of "practical things," or it may stand wholly outside.

V. If  $A$  is not equal to  $B$  and  $C$  is not equal to  $B$ , we cannot draw an inference as to the relation between  $A$  and  $C$ . The **Fallacy of Negative Premises** re-

sults from an attempt to draw a conclusion from two negative premises. It is shown in this example :

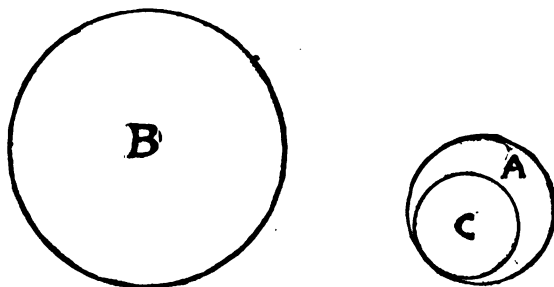
No classical study is advantageous;  
 German is not a classical study;  
 $\therefore$  German is advantageous.

The fallacy is evident from the relation of the circles.



While "German" is excluded from "classical studies," it may be within the circle of "advantageous things" or without the circle.

VI. If  $A$  is excluded from  $B$  and  $C$  is included in  $A$ , we must infer that  $C$  is excluded from  $B$ .

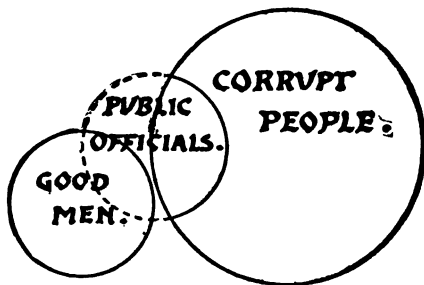


Names are not given to violations of this or the two following rules.

### VII. Example under Rule VII :

Some public officials are corrupt;  
 Some good men are public officials;  
 $\therefore$  Some good men are corrupt.

"Some good men" may be included amongst "public officials" without being within the circle of "corrupt people." No conclusion can be drawn from two particular premises.



### VIII. This rule may be illustrated thus :

All American citizens are free;  
 Some Negroes are American citizens;  
 $\therefore$  Some Negroes are free.

This conclusion is valid, for no principle of the syllogism is violated. But it would be incorrect to form a general conclusion and say, "All Negroes are free."

**75. MOODS. FIGURES.** Since there are four kinds of Major Premises, and each of these four kinds may have four Minors, making 16 pairs of premises, and each of the 16 pairs may have four kinds of Conclusions, evidently there may be 64 forms called *Moods* of the syllogism; but only 11 of these are valid, the remainder violating the rules given above.

Also there are three (some agree to four) *Figures* of

the syllogism, depending upon the position of the middle term in the premises.

But the study of Moods and Figures belongs to extended works upon Logic, and it is of doubtful utility to the ordinary student, since the Figure does not affect the essential form or the laws of the syllogism, and the invalid Moods may be detected as ordinary fallacies.

**76. THE ENTHYME.** The ordinary method of reasoning is not the formal one just studied, but it is always abridged. An abridged syllogism is called an *Enthymeme*. Instead of the full form given in the example, we may say: "Logic is useful, for all scientific study is useful," or "Logic is useful because it is a scientific study." In our every-day reasoning one or two elements of the syllogism are usually omitted. We say simply, "It will rain to-morrow;" but, if forced to a reason, we say, "Because it is cloudy;" and, if urged still further, we must state the Major Premise, "It always rains directly after such indications." We may conclude that all our deductive reasoning implies the full form of the syllogism with major and minor premises, even when the full form is not stated.<sup>1</sup>

**77. HYPOTHETICAL SYLLOGISM.** Referring to section 67, we find mentioned three classes of propositions, *Categorical*, *Hypothetical*, and *Disjunctive*. In the processes of reasoning so far presented categorical propositions have been employed. There are forms of reasoning in which a Hypothetical or Disjunctive proposition is employed. The first form is the *Hypothetical Syllogism*. Example:

If there be plenty of rain in the spring in Colorado, there will be good crops (*Major Premise*);

But there is abundance of rain this spring (*Minor Premise*);

∴ There will be good crops.

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<sup>1</sup> For a different view see Spencer, Vol. II, Part VI, Chap. VIII, §§ 302 and 305.

Still another illustration :

If this scheme is a good one, it will prove well in application ;  
 It does not prove well in application ;  
 ∴ The scheme is not good.

The first example, in which the Minor Premise is affirmative, is called a *Constructive Hypothetical Syllogism* ; the second example, in which the Minor is negative, is called a *Destructive Hypothetical Syllogism*. In the first example the Antecedent is affirmed, and in the second example the Consequent is denied ; and the conclusion is valid in both cases. These are typical cases, and we may infer the rule—**In the Hypothetical Syllogism we must affirm the Antecedent or deny the Consequent.**

A violation of the above Rule is called **Fallacy of Conditionals**. By denying the Antecedent we fall into a fallacy. In the first example, if we were to deny the Antecedent and say, "There is not plenty of rain," we could not infer that the crops would be poor, because summer rains, an abundance of snow in the mountains, together with the use of irrigating ditches, might insure good crops. The fallacy of affirming the Consequent is seen in this example :

If men are honest, they will be successful ;  
 This man is successful ;  
 ∴ He is honest.

In fact, there are many apparently successful men who are not honest, and this possibility is not denied by the syllogism ; hence this man may belong to the class of dishonest persons.

Hypothetical syllogisms may be put in the categorical form and fall under the rules of the syllogism already stated. Thus the second example would read:

All good schemes prove well ;  
 This scheme does not prove well ;  
 ∴ The scheme is not a good one.

**78. DISJUNCTIVE SYLLOGISM.** In a general form, the Disjunctive Syllogism may be thus expressed: *Affirmative Mood*—

*A* is either *B* or *C* (*Major Premise*) ;  
*A* is *B* (*Minor Premise*) ;  
 ∴ *A* is not *C*.

**Example:**

The function of the President is either executive, or judicial, or legislative;  
 His function is executive;  
 $\therefore$  It is not judicial or legislative.

**Negative Mood—**

$A$  is either  $B$  or  $C$ ;  
 $A$  is not  $B$ ;  
 $\therefore A$  is  $C$ .

**Example:**

This man in this case is influenced either by duty or by policy ;  
 But it is contrary to his character to be influenced by duty ;  
 $\therefore$  He is influenced by policy.

**"The Disjunctive Syllogism proceeds on the principle that the notion is divided into subordinate species, and is governed by the rules of Logical Division: that the species must make up the genus, and that the species must exclude one another."**

The first example is true only on the supposition that the terms are mutually exclusive. If there is a function belonging to the President that is both judicial and executive, then this mixed function should be expressed in the major premise.

Disjunctive Syllogisms may be expressed in categorical form, as:

Every executive function of the government is non-judicial and non-legislative;  
 The function of the President is executive;  
 $\therefore$  It is non-judicial and non-legislative.

**79. DILEMMA.** There are four forms of the Dilemma:

First, the *Simple Constructive*—

If  $A$  is  $B$ , or if  $C$  is  $D$ ,  $E$  is  $F$   
 But either  $A$  is  $B$ , or  $C$  is  $D$ ;  
 $\therefore E$  is  $F$ .

**Example :**

If the judge decides the case in favor of  $A$ , or if he decides in favor of  $B$ , he will incur censure ;  
 But either he must decide in favor of  $A$ , or he must decide in favor of  $B$ .  
 $\therefore$  He must incur censure.



Second, the *Complex Constructive*—

If *A* is *B*, *C* is *D*; and if *E* is *F*, *G* is *H*;

But either *A* is *B*, or *E* is *F*;

∴ Either *C* is *D*, or *G* is *H*.

Third, the *Simple Destructive*—

If *A* is *B*, *C* is *D* and *E* is *F*;

But either *C* is not *D*, or *E* is not *F*;

∴ *A* is not *B*.

## Example :

If you are to be happy in public office, your party must approve your measures, and the opposing party must be pleased ;

But either your party will not approve, or the opposing party will not be pleased ;

∴ You can not be happy in office.

Fourth, the *Complex Destructive*—

If *A* is *B*, *C* is *D*; and if *E* is *F*, *G* is *H*;

But either *C* is not *D*, or *G* is not *H*;

∴ Either *A* is not *B*, or *E* is not *F*.

In the Dilemma there are two alternatives, called *Horns of the Dilemma*. If a person opposes the argument of a Dilemma, he decides which alternative he will oppose, or “chooses his horn;” for instance, in the example of the Simple Destructive Dilemma, the party addressed might reply, “I can be happy in office without the approval of the opposing party.” If one can not disprove either alternative he is said to be “transfixed by either horn.” He may, however, suggest another alternative showing that the alternatives of the dilemma are not exhaustive.<sup>1</sup> In the above example, one might reply that he could be happy in the perform-

<sup>1</sup> Dr. McCosh quotes apropos of this: “Triptolemus Yellowley thought there were two ways of draining Braebaster Loch, one down the Linklater Glen, the other by the Scalmeister Burn. But the Udaller saw the imperfection of his division, ‘There is a third way; let each of us start an equal proportion of brandy, lime-juice and sugar into the loch, and let us assemble all the jolly Udallers of the country, and in twenty-four hours you shall see dry ground where the loch of Braebaster now is,’ ”

ance of public duty, without regard to approval. Fallacies are common in this form of reasoning, from the fact that a person may present in argument two alternatives which are favorable to himself.

**80. MATERIAL FALLACIES.** The fallacies which have been considered in previous sections are called *Logical* or *Formal Fallacies*, because they violate valid forms of the syllogism, and the errors may be detected by application of the rules of the syllogism. There is another class of errors in reasoning called *Material Fallacies*, because the errors lie in the matter itself, and it requires some knowledge of the subjects to detect them. In classifying and discussing these fallacies, logicians since the time of Aristotle have been accustomed to follow his method. The more important ones will be presented briefly.

**1. Fallacia Accidentis (Fallacy of Accident) and its Converse.** A curious example often used is this :

What you bought yesterday you eat to-day;  
 You bought raw meat yesterday;  
 ∴ You eat raw meat to-day.

The accident of rawness is not implied in the Major, but is stated by the Conclusion. Loyalty to rulers is a duty, but probably was not a duty toward Charles I. of England, owing to the peculiar character of his reign. Those who urged the general principle in his case reasoned fallaciously. In these instances *a general principle is applied to a particular case without consideration of the peculiar conditions of the case.*

*Conversely*, we may fall into error by *arguing from a special case to a general principle* without due consideration of the peculiarities of the case. Failure in the

first attempt to perform a difficult task may not imply failure in all future attempts. That friendship was betrayed in a particular instance should not lead one to doubt the value of all friendship.

**2. Fallacy of Shifting Ground.** In argument the practice of dodging from one standpoint to another in face of each unanswerable objection is common. By understanding the grounds clearly at first, this may be avoided.

Under the above head may be placed the **Fallacy of Many Questions**. You might ask a physician, "Is deceit wicked?" and receive an affirmative reply; then respond that his act, in deceiving a patient that hope might aid his recovery, was wicked. At least two questions were contained in the one: "Are grosser forms of deception usually wrong?" and "Is deception ever allowable in a particular case?"

**3. Petitio Principii (Begging the Question, Reasoning in a Circle).** This fallacy consists in *drawing a conclusion and then using the conclusion to establish one of the premises*. We cannot say, "People approve my plan, therefore it is good," and then turn about and say, "My plan is good, therefore people should approve it."

A common method of "begging the question" is in the use of epithets which assume the point under discussion. "Your conduct is unprofessional and therefore blameworthy" would be an instance, if the dispute arose as to whether the conduct was unprofessional. Such fallacies are called **Question-Begging Epithets**.

**4. Ignoratio Elenchi (Irrelevant Conclusion).** This fallacy consists in *establishing a conclusion not in question in such a way that it may be mistaken for a pertinent con-*

*clusion.* A story related of an Irishman is apropos: being charged with theft on evidence of three witnesses, he proposed to call thirty witnesses who did not see him do it. To show that men succeed without an education does not argue that education is of no value.

When the character of the man is used against the cause he advocates, the reasoning is called **Argumentum ad Hominem**; this fallacy is a form of Irrelevant Conclusion. That he who advocates temperance is a drunkard is no proof against the correctness of his arguments. An attorney made a humorous use of this fallacy when he passed a brief to the barrister with the remark, "No case; abuse the plaintiff's attorney."

**Argumentum ad Populum** is a method of appealing to the prejudices and feelings of the people as a substitute for argument. The expression, *Vox populi, vox Dei*, is many times used by orators when the people are wrong.

5. Other Material Fallacies are given in larger works of Logic; there is room to mention only two or three of them here. **Argumentum ad Ignorantiam** is the fallacy of affirming a belief because no one can prove the contrary. **Fallacy as to Burden of Proof** is employed in case a man asks you to prove he is not right, when it is his business to establish his principle. The **Argument from Consequences** is frequently fallacious, if a principle is involved. That a course seems expedient may be no reason for pursuing it, if it violates a principle of right. The pursuit of truth has often been opposed because a discovery might tend to overthrow some dogma. "But if a doctrine

be true, and a deed be right, the consequences must be good whether we see it or not.”<sup>1</sup>

#### **EXERCISES IN DEDUCTIVE REASONING.**

1. Give an original or selected example of violation of each of the Rules I, III, IV, and VIII of the Syllogism.

2. Supply the omitted propositions in the following enthymemes: There was a dull sunset, and it will rain to-morrow; A body is lighter at the top of a mountain than at its foot because it is farther from the center of the earth; The man is an oppressor of the poor and should not be elected to office; Logic is a science, hence a valuable study; History is a useful study, for all knowledge is useful.

3. Give an original example of each form of the Hypothetical Syllogism; also examples of Fallacy of Conditionals.

4. Construct an example of the Disjunctive Syllogism; examples of the simple forms of the Dilemma.

5. Point out the kind of material fallacy lurking in each of these examples:

This man is unreliable; hence the cause which he advocates is not good.

I have been cheated in this business transaction, and I will never trust men again.

You can not show the opinion to be false; hence it is to be accepted.

To take away the property of another is a crime; hence the liberation of the American slaves was wrong.

The constitution is sacred; hence this reform bill which violates the constitution should not pass.

The question arising as to whether labor organizations are useful, one may argue that they have done harm and hence should be abolished.

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<sup>1</sup> For a more extended consideration of Fallacies consult McCosh's *Logic*, Jevons' *Primer of Logic* and Jevons' larger work revised by Hill.

Fallacies of Induction will be considered under the subject of Induction.

Our party is the one to join because it advocates right principles; these principles are right because they are advocated by our party.

The advocacy of Emancipation was unpopular and led to civil discord; therefore the movement was wrong.

#### INDUCTIVE REASONING.

**81. NATURE OF INDUCTION.** We have been learning the principles of Deductive Reasoning, in which the conclusion is *deduced* from premises. In this method of reasoning the major premise is usually the statement of a general principle, and in the conclusion this principle is applied to a particular case falling under the principle. In the example—"All sciences are useful; Logic is a science; therefore Logic is useful"—the major premise is a general principle, the minor is a particular observation, and upon the correctness of the principle and the observation depends the truth of the conclusion. In the examples thus far used the truth of the general principle has been assumed; we are now to learn how general principles are established. During the growth of learning, men have noticed that in the case of Physics, Astronomy, etc., knowledge arranged and generalized, i.e. scientific knowledge, is more available than unclassified knowledge, and that the scientific study of Physics, Astronomy, etc., is a valuable training for the mind; hence wise men conclude that "All science is useful." An acquaintance with the definition of Science and a knowledge of the nature of Logic lead to the statement, "Logic is a science." The belief that "men are mortal," that "all metals are useful," arises from the experience and observation of mankind. The vast

number of general beliefs and truths which are the accumulated wisdom of ages, and which we take for granted, and employ in our deductive reasoning, has grown out of the experience and observation of men. Induction is the process by which, from observation of particular facts, general principles or laws are established.<sup>1</sup>

The conclusions of inductive reasoning may be used as premises in deduction.

In ancient times men guessed at many of their premises, and, although they understood Aristotle's method of Logic which is used to-day, their conclusions were often false because their premises were false. Aristotle thought it reasonable that large bodies should fall faster than small ones, and so stated. Some one in modern times tried an experiment by dropping stones of unequal size from the Tower of Pisa, and found that they fell at the same rate, and, from this experiment, discovered one of the laws of falling bodies. The dictum of Aristotle was guesswork; the inference of the experimenter was a general principle based upon observation. In the thirteenth century, Roger Bacon did much to show what could be accomplished in the discovery of truth by observing nature and its phenomena; later Galileo employed the same method, and Francis Bacon wrote a work setting forth the principles of the Inductive System. Since the time of Lord Bacon, the Inductive Method has been generally employed in scientific in-

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<sup>1</sup> Mill defines Induction thus: "Induction is that operation of the mind by which we infer that what we know to be true in a particular case or cases, will be true in all cases which resemble the former in certain assignable respects. . . . *It proceeds from the known to the unknown.*"

vestigation, and through its means progress in discovery has been marvelous.

82. THE PROCESSES NAMED "PERFECT INDUCTION," "MATHEMATICAL INDUCTION," AND "COLLIGATION OF FACTS" AS VIEWED BY MR. MILL.<sup>1</sup> Mr. Mill regards Induction as a process of inference, i.e. a proceeding from the known to the unknown, and, therefore, would exclude certain processes named in this section, because in them he regards the conclusion as no wider than the premises. Whether we agree or disagree with Mr. Mill, the processes are appropriately described in connection with Induction.

1. As examples of "Perfect Induction" the following may be used: I observe a number of apples lying on the table; I note that this apple, that apple, etc., throughout the entire number are red; but this apple, that apple, etc., are all the apples on the table; therefore all the apples on the table are red. Thinking of A, B, C, etc., the pupils of a certain class, I remember that each is of studious habits; but A, B, C, etc., constitute the whole class; hence I pronounce the whole class studious. The conclusion in these examples is a mere *summary, abbreviated expression or comprehensive statement*, not an inference from known things to unknown; hence Mr. Mill's definition excludes them from inductive processes.

2. I prove in case of a particular polygon that the sum of its interior angles, together with four right angles, is equal to twice as many right angles as the figure has sides—and conclude that the law holds good of all polygons. In calculating the terms of a

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<sup>1</sup> Mill's Logic, Bk. III, Chap. II.



mathematical series, when the law of the series is discovered, we confidently apply the law to any remote term of the series. These are cases of "Mathematical Induction," but by some excluded from Induction proper, because, from the nature of mathematical demonstration, there is an absolute certainty that the case in hand is typical of the class, and no step in advance is made when the principle proven in the particular instance is affirmed of all possible instances of the same kind.

3. A person may wish to know the shape of a large cathedral, and find it necessary to walk around it, viewing its structure point by point; he then sums up his observations by the statement that the building is cruciform. Mr. Mill would regard this as a "descriptive operation" in which several facts are summed up in a single statement. To this process is applied the term "Colligation of Facts." Mr. Mill thinks that the process was the same when Kepler, by successive observations of the position of Mars in its orbit, determined the kind of curve of the orbit and described it as elliptical; although the inference that the orbits of the other planets not observed were elliptical was a true induction.

**83. LOGICAL INDUCTION.** The magnets which we have observed attract iron; we believe this to be true of all magnets. In our experience and the experience of men in the past, the sun rises at regular intervals; we believe it will do so in the future. This and that falling body observed fall a certain distance the first second, and in a certain increasing ratio in subsequent seconds, and we establish laws for these observed instances; we believe these laws hold good for all falling

bodies. We learn by experiment that water, alcohol, etc., are elastic, also that air, carbonic acid, etc., are elastic; we believe that all fluids are elastic. These conclusions are drawn from observation and experiment, but what is the ground of belief that what is true of some things observed is also true of other things not observed? **Belief in the uniformity of the laws of nature is the ground upon which we argue from the known to the unknown.** We may express the first example formally :

Whatever essential thing is true of the magnets I have observed is true of all magnets;

The magnets observed attract iron;

∴ All magnets attract iron.

In the first premise faith in the uniformity of nature is implied.

It is easy to see that the value of our conclusion will depend very much upon the extent and accuracy of our observation, and that in Logical Induction there can be no absolute certainty. An inhabitant of the torrid zone might say, "Water so far as I have seen exists as liquid or vapor, hence water is never solid." His false conclusion is due to his lack of experience. People for a long time firmly believed that all swans were white until the Australian black swan was discovered. The common errors and superstitious beliefs of men are due to hasty inaccurate generalizations. Because in two or three instances one happens to meet with some accident on Friday, he may conclude that Friday is an unlucky day.

In classification, we discover common characteristics of several things and form a group of all things possessing these characteristics. In Logical Induction, we

infer that what is true of some things observed is true of the whole class to which those things belong.

**84. ANALOGY.** Examples of reasoning by analogy are the following: The ripples upon the sands of the sea-shore are caused by the waves; probably the ripples in the ancient sandstones were caused by waves. Mars resembles the earth in possessing bodies of water, clouds, snow-covered polar regions, etc.; it may resemble it in being inhabited. Lightning resembles electricity in its report, zigzag course, etc.; probably it resembles it in its essence and is electricity. Here the formations and the appearance of the ore are similar to those in Leadville; hence probably here are valuable mines. We may infer from these typical examples that the formula for Analogical Reasoning may be thus expressed: "Two things resemble each other in one or more respects; a certain proposition is true of one, therefore it is true of the other."<sup>1</sup>

In reasoning by analogy we can affirm only some degree of probability, and the degree will depend upon the number of points of similarity and the circumstances of the case.<sup>2</sup> As a means of forming hypotheses Analogy is very important.<sup>3</sup>

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<sup>1</sup> The above formula for Analogy is given by Mr. Mill. Analogy means strictly a resemblance of relations. The fin of a fish and the wing of a bird are analogues, because in locomotion the fin bears the same relation to the water that the wing bears to the air.

<sup>2</sup> For example, the quality *a*, or the qualities *a*, *b*, *c*, are found in each of two objects; therefore probably the quality *d* found associated with *a* or with *a*, *b*, *c* in the one will also be in the other. This analogy passes at once into induction, so soon as we infer that the quality *d* will be found in all the members of the class containing *a*, *b*, and *c*.

<sup>3</sup> It is the uniform method of forming hypotheses to be tested

**85. COMPLETE LOGICAL INDUCTION.** In the processes of true induction thus far described there is only a degree of probability in the inference. These forms of induction are only the first stages of a complete induction. Let us take a well-known example of discovery and trace the successive steps until the Law was thoroughly established. Franklin, like other people of his day, had a natural curiosity to know the nature of lightning. (1) He carefully observed the phenomena connected with it, the zigzag course, the report accompanying, etc. (2) He was well acquainted with all the phenomena of frictional electricity, and noted a similarity between the phenomena observed and some of those of electricity; hence by analogy he reasoned that the two were similar in other respects, namely, in their essence, and assumed the hypothesis that lightning was electricity. (3) He next virtually proceeded with a process of deductive reasoning, making his hypothesis one of the premises of his syllogism, thus :

Electricity will follow conductors, give sparks, charge a leyden jar, etc. ;

Lightning is electricity;

∴ Lightning will follow conductors, give sparks, charge a leyden jar, etc.

(4) He next proceeded to verify by experiment this conclusion of his deduction, and, flying his kite to a passing cloud, he found that the force with which the cloud was charged followed the moistened string, gave sparks from the key attached, and charged a leyden

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and verified, or refuted by farther experience. Every scientific theory has its beginning in an analogy.

jar. Thus the hypothesis became established as a truth.

The process was the same in Newton's discovery of the law of gravitation. (1) Observation of bodies falling to the earth ; (2) proceeding by induction to the hypothesis that all bodies tend to fall toward the earth ; (3) the deduction that the moon being a body must fall toward the earth ; (4) the verification of this conclusion by a mathematical demonstration, that on his hypothesis the moon should revolve about the earth as it does. Thus his hypothesis became a Law.

The processes of a complete induction are: (1) Observation or Experiment, (2) Hypothesis, (3) Deduction, (4) Verification.

In many instances of discovery, many a hypothesis has been assumed and rejected until at last the right one was discovered, which stood the test when made the premise of a syllogism, and applied to explain all the observed facts.

**86. CAUSE. CANONS OF INDUCTION.**<sup>1</sup> Of the many antecedents that may go before an effect, it is necessary to be able to detect the antecedent necessary to the effect, that is, the Cause. An experimenter may wish to illustrate to a class, by using a ball and ring, the expansion of solids by heat. As antecedents to the effect he places the stand and ring on the table, he attaches the iron ball to a chain, and lights the lamp. None of these antecedent acts will expand the solid. When the heat is applied to the ball it expands, and we readily conclude that heat is the necessary antecedent or the cause of the expansion, while the others are merely incidental preparations. When a fire is lighted in a grate, the cause of the fire is not only the application of a match, but the presence of the wood and an adequate supply of oxygen, for without any one of these three antecedents the combustion

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<sup>1</sup> On this subject read Mill's Logic, Bk. III, Chaps. VIII and IX.

would not follow. **Whatever antecedents are always followed by an event—the event not occurring in absence of these antecedents—constitute the cause of the event.**

In order to facilitate the drawing of inferences as to causes of events certain methods of procedure have been marked out, and the laws of the methods, called Canons of Induction, have been stated. These methods are known respectively as *Method of Agreement*, *Method of Difference*, *Joint Method of Agreement and Difference*, *Method of Residues*, *Method of Concomitant Variations*. It should be noted that the Canons when used in reasoning are major premises of deductive syllogisms.

### 1. Method of Agreement.

**CANON.** In two or more instances when a phenomenon occurs, that antecedent which alone is common to them all is the cause of the phenomenon.

Gunpowder explodes when placed in a keg and a lighted fuse is applied; it explodes when placed in a gun-barrel, and percussion is applied to a cap placed in connection with the powder; it explodes when placed under water in a tube, and a current of electricity is passed through it on a poor conductor. Here the conditions vary, and the only circumstance common to the three instances is the application of heat by some means; we conclude that heat is the cause of the explosion.

### 2. Method of Difference.

**CANON.** "If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common, save one, that one occurring only in the former; the circumstance in which alone the two instances differ is the effect, or the cause, or an indispensable part of the cause, of the phenomenon."

Let the lower part of a barometer tube communicate with a receiver; when the air is exhausted the mercury falls, when the air is readmitted the mercury rises. Air is present when the mercury is sustained in the tube; all other circumstances remaining the same, air is absent when the mercury is not sustained; hence the pressure of the air sustains the mercury.

### 3. Joint Method of Agreement and Difference.

**CANON.** Whatever antecedent is alone common to a series of instances in which a phenomenon occurs—the phenomenon

not occurring in a series of instances which have nothing in common but the omission of this antecedent—is the cause of the phenomenon.

Dew gathers readily on grass, wool, cotton, etc.; with reference to the investigation these things have nothing in common but their high radiating power. Dew gathers slowly on polished metals, stones, earth, etc.; these things have nothing in common but the absence of a high radiating power. I conclude that the power to radiate heat rapidly is a favorable condition for the deposition of dew.

#### 4. Method of Residues.

**CANON.** If part of a phenomenon may be referred to known causes, the remaining part of the phenomenon may be referred to the remaining antecedents.

An example is quoted by Mr. Mill, the substance of which is here stated. By careful computation the velocity of sound in air, as depending upon the elasticity and density of the medium, had been made, but was found not quite to tally with facts; there was a residual velocity to be accounted for. The only residual circumstance was the heat produced by the condensation of air in the transmission of sound-waves. By further computation the increased elasticity of air by condensation accounted for the residual velocity.

#### 5. Method of Concomitant Variations.

**CANON.** If a phenomenon varies in a particular way, while an antecedent varies in any given way, the antecedent is the cause of the phenomenon.

The farther a core of iron rods is thrust within a primary coil, the more intense the current of electricity upon an adjacent secondary coil. The proximity of the bundle of iron rods is the cause of the increased intensity.

### 87. FALLACIES OF INDUCTION<sup>1</sup> (91).

1. Fallacies of Observation. These fallacies are classed by Mr. Mill as those of Non-Observation and those of Mal-Observation. **Fallacies of Non-Observation**

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<sup>1</sup> Read Mill's Logic, Bk. V, Chaps. IV and V.

arise in the following cases: (1) When one-sided instances only are likely to be remembered, as remarkable coincidences between dreams and events, the cases when there is no coincidence receiving comparatively little attention; (2) When a preconceived opinion exists, as in case of the old belief that a large stone would fall faster than a small one; (3) When the essential circumstance is not given due importance. As an example of the last I quote: "The celebrated John Wesley, while he commemorates the triumph of sulphur and supplication over his bodily infirmity, forgets to appreciate the resuscitating influence of four months' repose from his apostolic labors; and such is the disposition of the human mind to place confidence in the operation of mysterious agents, that we find him more disposed to attribute his cure to a brown-paper plaster of egg and brimstone than to Dr. Fothergill's salutary prescription of country air, rest, asses' milk, and horse exercise."

**Fallacies of Mal-Observation** arise when a person regards as true what he in reality only incorrectly infers. Here belong many idle reports based upon imperfect observation. A person falls into this error when in the night he mistakes a garment gently swaying in the wind for a moving ghost. People at the time the Copernican theory of the solar system was advanced said they knew the theory was not true, for they could see the sun rise and set.

**2. Fallacies of Generalization.** Amongst these fallacies may be mentioned first that of **Simple Enumeration**. This error consists in inferring that what has always been true so far as observed, is true generally and always will be true. **Example:** In the history



of nations all republics have shortly perished ; hence no republic will be permanent.

Another common fallacy is called **Post Hoc, ergo propter Hoc**. This error consists in regarding as relation of cause and effect that which is only a sequence. Examples : As fast as the per cent. of immigration to the United States has increased, the prosperity of the country has increased ; hence the prosperity is due to immigration. A remarkable auroral display was followed by a great war ; hence the aurora was the "fore-runner" of the war.

The last fallacy which we shall mention is that of **False Analogy**. This arises "when resemblance in one point is inferred from resemblance in another point, though there is not only no evidence to connect the two circumstances by way of causation, but the evidence tends positively to disconnect them." Example : A nation like a human being has its youth and maturity, therefore it must have its decline and death.

#### **EXERCISES IN INDUCTIVE REASONING.**

1. Give an example of Logical Induction; of reasoning by Analogy; of Complete Logical Induction.
2. What is the principle on which we rely in inferring from the known to the unknown ?
3. What is the difference between Induction and Analogy ?
4. Give an illustration of the uses of analogy.
5. When only may a hypothesis be accepted as a law ?
6. What primary principle or fact makes valid scientific inductions possible ? (See Porter, §§ 486, 487, 488, 496, 497.)
7. What is the use of the Canons ?
8. Illustrate the application of each of the Canons of Induction.
9. Point out the fallacy in each of these examples: When in Colorado I encountered a dust storm; hence it is a very disagreeable region. A period of general depression in business has fol-

lowed the advent of the present administration; hence it is due to the administration. A ruler is servant of the people; hence he should obey the wishes of the people. At a certain *séance* a ghostly figure appeared in full view; hence we must believe in the supernatural. The Oracle at Delphi proclaims this; hence the event will occur as predicted.

### APPLICATIONS.

**88. THE TRAINING OF MENTAL FACULTY IN THE SCHOOLS<sup>1</sup>** (58, 63, 71). Now that we have completed our view of the Intellect, let us consider briefly the work of the schools in training mental faculty.

In the PRIMARY-SCHOOL PERIOD, *Perception* is trained by handling and observing objects; *Memory* incidentally by all the work of the grade, and in special ways, as memorizing gems of literature; *Imagination* by tales and descriptions, and such designs and constructions as are employed in the kindergarten; the *Thinking Faculty* by use of simple judgments and reasons. Proper *Emotion* is fostered in many ways adapted to the disposition and needs of the child; the *Will* is strengthened by the restraints and demands of the school-room. The mind gains control of the body through such exercises as reading, speaking, singing, writing, calisthenics, and the sports of the playground.

In the GRAMMAR-SCHOOL PERIOD most of this work is continued, and in addition *Memory* and *Imagination*

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<sup>1</sup> Read Tate, Part I, Chap. III, pp. 60-81; Bain's Ed., Chap. VI; White's Pedagogy, pp. 84-98, 103, 109. On adaptation of subject and method to the stage of development read Rosenkranz, § 105.

are exercised in Geography and History; the *Reason* is trained by elementary science, grammar, and the processes of arithmetic.

During the HIGH-SCHOOL PERIOD *Perception* is used in drawing and in studying specimens and observing experiments. *Memory* is exercised in connection with all the work; the absolute memory, in retentive acquisition of selections in literature, theorems in Geometry, and the principles of science; the philosophical memory, in all retention of knowledge in logical relations. The *Imagination* is exercised in the study of literature and in many other ways. The *Inductive Reason* is trained by inductions in science and history; the *Deductive Reason* by mathematics. The finer *Emotions* are developed in the study of literature, and the growth of the feelings and desires in general naturally follows the accumulation of knowledge. The *Will* is trained in various ways to choose in view of worthy motives, and to engage in vigorous and long-continued effort. The mind gains control of the body through drawing, gymnastics, and military drill.

From our study thus far we may conclude that the human mind is a very complex thing; that the growth of all the faculties begins almost with the first experience of the child; that all the faculties are developed together, interlinking with each other, and aiding each other; that the period at which a considerable degree of development is reached and successful cultivation may begin is not the same for all the powers, but occurs in the sequence of *Perception*, *Representation*, *Conception*, *Judgment*, and *Reason*; that the development of the Intellectual Faculties should be towards the ideal attainment of *clearness and vigor of Reason*; that

so far as practicable the development of the mental powers should be symmetrical.

**89. SOME POINTS IN CULTIVATING THE POWER OF THOUGHT**<sup>1</sup> (58, 63, 71).

**1. Proceed from the Particular to the General.** The steps are: (1) Selection of Particulars; (2) Arranging so as to bring out the agreements; (3) Naming and defining. For instance, if you wish to teach the idea of a triangle, (1) draw several kinds of triangles, varying in size, on paper; (2) by arranging in a row, superposition, etc., bring out the idea of three-sidedness as common to all the figures; (3) name, and if possible get from the child a definition of this class of figures. In like manner typical processes precede the formation of rules in arithmetic, and an acquaintance with the familiar objects of natural scenery precedes the more general information of physical geography.

**2. Proceed from the Simple to the Complex.** The practice of teaching the elements of the letters in writing before complete letters or words are formed illustrates the principle. Frequently, in drawing, the formation of lines, angles, etc., is practiced before more complicated figures are attempted. In Geometry an acquaintance with straight lines and angles would precede their use in figures. Plane figures and simple constructions would precede the study of solids and complicated demonstrations.<sup>2</sup>

**3. Teach the pupil to think and do for himself.** The

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<sup>1</sup> See Spencer's Ed., pp. 120, 121; Bain's Ed., Chap. VII; Rousseau's *Émile*, pp. 106, 124, 130, 149. See *Maxims of elementary teaching*, White's Pedagogy, p. 105. Refer to the "Principles" of Comenius beginning p. 79.

<sup>2</sup> Read Spencer's Ed., pp. 147-153.

spirit of this principle may be shown by some of the examples employed by Rousseau. "In drawing a circle, for instance, I will not use a compass, but a point at the end of a cord which turns on a pivot. Afterward when I want to compare the radii of a semi-circle, Émile will laugh at me and tell me that the same cord held with the same tension cannot describe unequal distances." Again he forms an angle of sixty degrees, describes from the apex an entire circle and finds that the intercepted arc is one sixth of the whole circumference. He then describes a larger and again larger circle from the same apex until Émile, "vexed at his stupidity," informs him that the size of the circle does not affect the proportion of the arc. Rousseau would not begin instruction in geography with a globe, but causes his pupil carefully to observe a sunset, and the next morning the sunrise, dropping incidentally the remark, "I think the sun set over there, and now it has risen over here." If, after a few days, his pupil has not thought out what is thus suggested, in answer to the pupil's question he points out how the sun goes from the rising to the setting, and leaves the inference to the pupil. As a last example from Rousseau's very suggestive work may be given the experiment with a straight stick thrust into water. The pupil is caused to view the stick from different points and in different positions as it is thrust into the water or removed; to pass his hand along it, etc.; he thus has a lesson concerning hasty inferences from false appearances. The purpose of education is not merely knowledge, but the power to know. "Cramming" and "pouring in" processes do not properly train faculty; education is a growth and development.

The powers are strengthened by exercise ; hence the pupil should be stimulated to think and do for himself.

**4. Simple Processes of Inference.** Some examples may be given of simple deduction and induction, such as may be employed incidentally during earlier periods of education.<sup>1</sup> Only that which is lighter than air rises in air ; then smoke is lighter than air. I can lift a stone in water which I cannot lift in the air ; hence the stone is lighter in water, the water helps lift the stone. Flesh-eating animals are carnivorous ; then the cat is carnivorous. Good conductors of heat in the winter are cold to the touch ; then the metal door-knob is a good conductor. It never rains unless there are clouds in the sky ; then the clouds cause rain. The examples thus far are *Deductive*. Some examples of *Induction* follow. The air in this inverted tube expands when heated, as shown by the bubbles driven out through the water ; water in a full kettle runs over when heated ; this wire grows longer by heating ; hence heat expands bodies. If I tie a piece of rubber over the mouth of a tumbler and invert the tumbler in water, the rubber is pressed upward ; if I place the mouth sidewise in the water the rubber is pressed inward sidewise ; if I place the tumbler upright under the water, the rubber is pressed downward : hence water presses in every direction. If similar experiments are employed for air a broader generalization may be reached, namely, that all fluids press equally in every direction.

**5. Analysis and Synthesis.** Analysis proceeds from

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<sup>1</sup>For numerous examples, see Tate, pp. 216-224.

a whole to its elements, synthesis proceeds from elements to a whole. These processes are constantly associated in instruction, but often the distinction is not fully understood. Examples of each method follow :

**Examples of Analysis.**

Deductive Reasoning.  
Application of principles.  
Teaching words, then letters.  
Applying rules to solution of problems.  
Analyzing sentences.  
Teaching the globe or map.

**Examples of Synthesis.**

Inductive Reasoning.  
Establishing principles.  
Teaching letters, then words.  
Making rules from typical examples.  
Constructing sentences.  
Beginning with familiar scenery.  
Reading.  
Description.  
Learning history.

There is no law for the use of analysis and synthesis ; one process supplements the other. Which shall precede must be determined for the case in hand.

**90. TRAINING IN THE USE OF WORDS (62).** As the field of knowledge and hence the vocabulary enlarges, correct definitions in the child's own words, with illustrations, must be demanded constantly. Throughout the course of instruction nothing is more important than the formation of correct Concepts. A large vocabulary of words well defined, which means a large store of general notions in the mind, must be gained. In every study, whether Physics, Mathematics, or the writings of standard authors, the aim should be to gain clear notions.

The Greeks and Latins were highly cultivated peoples, and had elaborate languages in which they embalmed their concepts. A careful study of these

tongues enriches our general and scientific vocabulary.

**91. AVOIDING THE COMMON SOURCES OF ERROR IN REASONING** (62, 87). Locke's views as to the causes of defective reasoning may be summed up thus: (1) Disposition to accept common beliefs and statements without troubling to examine for one's self; (2) Permitting passion and prejudice to bias our views instead of examining evidence judicially; (3) Failure to examine all the conditions that may affect the result. The means of correcting these faults are obvious enough. (1) We should examine freely for ourselves, with both modesty and independence, whatever beliefs claim our acceptance. (2) We should avoid the most common and serious fault of rejecting information when it is within our reach, because it would not suit our inclinations or apparent interests to change our views. (3) A knowledge of the principles of Logic and an acquaintance with common fallacies should be gained, as thus the power and habit of accurate reasoning may be strengthened. The study of Mathematics and Science largely increases the logical power.

#### EXERCISES.

1. Give an example of each of the processes of thinking.
2. What is the difference between Conception, Judgment, and Reasoning?
3. Why are Thinking processes called *elaborative*?
4. Give an original example of forming a Concept.
5. What is the difference between Conception and Imagination?
6. Distinguish Classification from Conception; Abstraction from Conception.
7. Give examples of Logical Division, using *Buildings, Schools*.
8. Define species and genus.



9. Can we think without language?
10. Are the names first used by children applied to individuals, or to concepts?
11. Give examples of the abuse of words.
12. What is "implicit" Judgment; "implicit" Reasoning?
13. What may be said of the habit of permitting prejudice to influence belief?
14. Are axioms necessary truths?
15. Give an original example showing the difference between Deduction and Induction.
16. Point out the difference between Presentative Knowledge, Representative Knowledge, and Thought Knowledge.
17. Estimate the average development of mental faculty at the time the child enters school.
18. What is meant by symmetrical development?
19. Should we always proceed from the particular to the general and from the simple to the complex?
20. Should the pupil ever be told what he can discover for himself?
21. Give some practical illustrations of ways in which the judgment of a child may be corrected, or his attention called to causes of common phenomena.
22. Distinguish Analysis from Synthesis in Arithmetic.
23. Can all the principles of studies in a school course be taught inductively?

## FEELING.

### INTRODUCTION.

**92. NATURE OF FEELING.** We are conscious of agitations and impulses of the mind which are neither acts of Knowing nor acts of Will ; these are Feelings. Feeling is any state or act of the mind which can not be regarded as Knowing or Willing.<sup>1</sup>

I feel pain from a wound in my finger ; I feel pain at the death of a friend. The origin of the former is referred to the body ; the latter arises in the mind on the receipt of sad news, and can in no way be referred to the body. Feelings may be classed as Physical Feelings, called Sensations, and Psychical Feelings, called Emotions.

You feel pain from a burn, sorrow for a wrong, an uneasy desire for improvement. On the other hand, you may feel the exhilaration of health, joy at unexpected good fortune, pleasure in a desire gratified. Feelings may be classed as Agreeable or Disagreeable.

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<sup>1</sup> "There are three ultimate modes of mind—Feeling, Volition and Intellect. Volition is action under feeling; its *differentia*, therefore, is active energy for an end, which is a distinctive and well-defined property. Intellect has three constituents,—discrimination, similarity, retentiveness,—all clearly definable. The precision attaching to Volition and to Intellect gives a precise *negative* definition to Feeling. Thus any mental state not being Action for an End, and not regarded as Discrimination, Agreement, or Retentiveness must be viewed as Feeling."—BAIN on the Emotions.

Feeling may be defined as any mental state of pleasure or pain.

**93. RELATION TO KNOWLEDGE.** While, as learned under Perception, the Sensations precede knowledge, the higher feelings, namely the Emotions, follow our knowledge of things.<sup>1</sup> Light-waves from its plumage strike the eye and produce sensation in my mind, the music of its song reaches the ear, before I know that a bird perches on a branch of the neighboring tree. News of impending danger is followed by a feeling of consternation; news of victory is followed by shouts of joy. The pleasures of perception, memory, imagination, etc., arise in view of acts of knowledge. While the emotions follow, they are immediate, indeed are inseparable, accompaniments of every Intellectual act.<sup>2</sup> The Emotions constitute a world of inner experience, awakened by our knowledge of the outer world, which make up the happiness or misery of man.

**94. RELATION OF FEELING TO ACTIVITY**<sup>3</sup> (120). According to Hamilton's "Theory of Pleasure and Pain," pleasure springs from the natural exertion of our powers, and pain from their overstrained or repressed action.<sup>4</sup>

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<sup>1</sup> Hamilton, Lect. XLI, p. 567.

<sup>2</sup> "All feeling is the state in which we are conscious of some of the energies or processes of life; as these energies or processes differ, so will the correlative feelings. In a word, there will be as many different Feelings as there are distinct modes of mental Activity. . . . The feelings are not primitive and independent states, but merely states which accompany the exertion of our faculties."—HAMILTON, Lect. XLV.

<sup>3</sup> Hamilton, Lect. XLII, pp. 575-577.

<sup>4</sup> "We feel positive pleasure, in proportion as our powers are exercised, but not over-exercised; we feel positive pain in pro-

We know that we find pleasure in muscular exertion; "a pleasant thing it is for the eyes to behold the sun;" there is pleasure in the exercise of memory, imagination and reason. Pleasure arises from the exercise of all our powers and faculties. On the other hand, an intense light, long-continued physical labor, or the excessive use of any mental faculty gives pain; physical or mental inactivity creates an uncomfortable restlessness.

"Absence of occupation is not rest;  
A mind quite vacant is a mind distressed."

We now obtain a practical view of labor of all kinds, and especially of education. The healthy exercise of each of our powers is pleasurable. Pleasure in action incites the will; this is a leading motive for all activity. Men exert themselves not only to gain happiness, but to avoid pain, or to remove ennui.

**95. LAWS OF INTENSITY'** (120). Hamilton reduces the causes which modify the intensity of pleasure or pain to four: "An object rouses the activity of our powers, (1) In proportion as it is **New or Unexpected**; (2) In proportion as it stands in a relation of **Contrast**; (3) In proportion as it stands in a relation of **Harmony**; and (4) In proportion as it is **Associated with more, or more interesting, objects.**"

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portion as they are compelled either not to operate, or to operate too much. All pleasure, thus, arises from the free play of our faculties and capacities; all pain from their compulsory repression or compulsory activity."—HAMILTON, Lect. XLIV, p. 608.

This theory may not apply to all cases, but it is an exceedingly important view.

<sup>1</sup> Hamilton, Lect. XLIV, p. 608.

With reference to the first principle, change in kind and degree of activity gives pleasure. You are tired of study, you enjoy exercise; you are tired of exercise and enjoy a return to books. Painful stimulation, prolonged, loses its intensity; thus punishment as a means of discipline, too often repeated, loses much of its force; our sensibility becomes dull after a long period of bodily or mental suffering. According to the same principle satiety follows excess of enjoyment.

Secondly, by contrasting our present condition with some previous condition of pain or with the unfortunate condition of others our pleasure is heightened. The merchant enjoys more the satisfaction of his success as he recounts his early struggle with fortune. After enjoying a period of prosperity, people feel more keenly the condition of poverty.

Thirdly, whatever is in keeping with present circumstances or trains of thought, whatever is in good taste, is a source of pleasure. On an occasion of festivity a sermon would grate harshly on the feelings, as would a flash of wit during some sacred ceremony. If two opposing emotions arise there is a conflict; when emotions conspire together each strengthens the other.

As to the fourth principle, an object in itself pleasing may bring with it a train of painful associations, while an object of comparative indifference through its associations may become a source of positive pleasure. A beautiful memento reminds you of lost friendship. You are about to throw away some object as worthless when you recognize it as a toy of your childhood, and you cherish it with a new feeling of regard.

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**96. EXPRESSION.**<sup>1</sup> There is an inherited tendency to accompany emotion with facial expression and attitudes and gestures of the body. This outward expression is a means of studying the feelings of others, and upon it is based largely the growth of sympathy. Much of the effect of elocution, of art and of stage acting depends upon an intimate acquaintance with the physical expressions of emotion.

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<sup>1</sup> Read McCosh, *The Motive Powers*, Bk. I, Chap. IV, p. 78 *et seq.*

## SENSATIONS.

**97. CLASSIFICATION OF SENSATIONS.** Sensations are of many kinds. There are sensations not proceeding from any one of the "five senses;" these are called *General*. The sensations proceeding from the five sense-organs are called *Special*. Without continuing the analysis we may tabulate the classes of sensations given under Perception. The Instincts and Appetites, though general sensations, may form distinct classes.

Feelings	Sensations	Instincts	{	to care for young " seek food, etc.
		Appetites	{	for sleep " exercise " rest " food " drink
		General Sensations	{	Muscular Sensations { of injury " fatigue " repose
			{	Nervous Sensations { of exhilaration " exhaustion " temperature
			{	Vital Sensations { of digestion " circulation " respiration
		Special Sensations	{	of Touch (including the "Muscular Sense") " Sight " Hearing " Taste " Smell
		Emotions		

*Instincts* are blind impulses to action; they are aimed to meet the needs of the individual. As we rise in the scale of being, intelligence increases, instinct decreases. *Appetites* are periodic cravings to meet physical wants. The bee stores up his honey by instinct, appetite incites him to eat it. *Muscular Sensa-*

tions arise from affections of the muscles; *Nervous Sensations* spring from conditions of the nerves; *Vital Sensations* report the condition of the vital organs.

**98. IMPORTANCE OF THE SENSATIONS (121).** The **Natural Appetites** seek the rest and repair of the body. The physical nature reports its needs to the mind,—calls for food, for pure air, for rest. The responsibility is thus taken from the mind which might harmfully neglect bodily needs. Most human beings possess **Acquired Appetites**, such as those for opium, tobacco, coffee, and alcohol. These appetites are morbid and are likely to prove dangerous, because they grow in intensity and may enslave the will of the individual. There is nothing more pitiable than an intelligent human being controlled by the morbid appetites of his animal nature, and unable to enjoy the freedom of his high intellectual and moral powers.

The pleasure in **Muscular Action** is an incentive to labor; pain follows an excess of physical exercise. After a period of exertion there is pleasure in repose. Bodily discomfort from cold, heat or unnatural positions may seriously disturb mental activity. **Nervous** people are incapable of full enjoyment and usefulness; the exhilaration of health contributes to courage and success.

The **Vital Organs**, when acting normally, produce little feeling of pleasure or pain. When disturbed by disease their action may become painful. Indigestion is painful and may seriously affect the happiness and success of its victim.

The **Special Sensations** give us knowledge of objects, and the mind enjoys this knowledge; but there is a



pure "sensuous"<sup>1</sup> enjoyment furnished by each of the five senses. Beautiful colors please the eye, musical sounds soothe the ear, sweet perfumes are grateful to the nostrils, velvet is agreeable to the touch. These sensuous elements, as we shall see, are combined with our intellectual enjoyment of Beauty.

The Physical Feelings as a whole are intimately connected with problems of education. Sensations are prominent in the child's mind; he desires physical comfort; hence he must at times be controlled by rewards and punishments that affect the body. As the child grows he must be taught to control the body, to sit quietly, to turn his mind from physical conditions and attend to study. As soon as possible, rewards and punishment should appeal to his higher, his spiritual nature. No person can attain the highest mental growth, if he is eternally conscious of his body. A resolute will may thrust the physical feelings into the sub-conscious region. The history of martyrs shows that ecstatic joy may accompany excruciating torture.

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<sup>1</sup> "Lotze distinguished the feelings, as mental conditions of pain or pleasure, from sensations as indifferent elements of our percepts of things. Yet, in fact, sensations are always, or usually, colored with feeling; and analysis is therefore obliged here to distinguish in theory what coexists in fact. Feelings are of two kinds: 'Sensuous,' as coming from bodily impressions; and 'Intellectual,' as flowing from the relations of ideas."—LADD, p. 500.

## THE EMOTIONS.

**99. NATURE OF THE EMOTIONS (122).** The Emotions are mental states of pleasure or pain which spring from and accompany our Intellectual acts. Sensations are referred to the body; Emotions are referred to our ideas, to all our acts of knowing. Without knowledge acts, emotional acts are impossible.

The natural expression of Emotion tends to heighten the emotion, because it strengthens the idea from which the emotion springs. Repression of the signs of emotion diminishes the emotion. The child, frightened by imaginary dangers in the dark, becomes more frightened if he attempts to run from them. By use of a pathetic tone and other signs of grief one may produce in himself the emotion of grief. When angry, our anger is increased if we express the signs of anger. Whistling keeps up the courage. A humble attitude tends to produce a humble feeling. A noble bearing heightens the emotion of self-esteem.

Emotion is the occasion of interest, hence it arouses the attention and aids the memory. The epoch of history which you are studying, by its conflicts, by the valorous deeds of its great actors, by the political and social changes wrought, by the many phases of human welfare presented, awakens many vivid emotions; you give your undivided attention to the historical picture and it makes an indelible impression on the memory.

Emotion stimulates to action. You view a painting

upon the wall. If it awakens no emotion whatever, —if it is a matter of perfect indifference, you pass it by. The anticipation of pleasure in its artistic merit will lead you to advance and examine it. Pleasure in study leads you to continue the study. Painful regret at waste of time will incite you to renewed effort.

**Habit strengthens Emotion.** You feel morose and indulge the feeling. Day by day the feeling grows and may become a permanent trait. On the contrary, you assume a cheerfulness you do not feel; the effort becomes tendency, and a cheerful disposition may be established. Repress anger and the tendency to anger is weakened.

“For use almost can change the stamp of nature.”

**Emotions are Retrospective, Immediate or Prospective.** The recollection of childhood, home and mother awakens sacred sentiments. You approach the task before you with love and courage. The hope of an honored and happy old age stimulates to earnest effort for success.

**100. CLASSIFICATION.** The emotions are very numerous and some of them very complex. It is possible to observe the ordinary emotions as they arise, make a list of them, and group together such as possess common characteristics. Many systems of classification have been employed by different philosophers —none of them perhaps altogether satisfactory. For the purpose of this study some system may be adopted which, with reference to the application of principles, is convenient and practical.

I am hopeful of success in my enterprise or I fear

failure. These emotions are awakened by ideas that refer to self, hence they are called **Egoistic**. I sympathize with my friend in his misfortune. The feeling of sympathy is aroused by ideas that refer to another and is called **Altruistic**. When Newton discovered the law of gravitation, doubtless he was thrilled with emotion at the result of his persevering inquiry. The pursuit and discovery of truth is accompanied by **Intellectual** emotions. You enjoy the sunset, or the statue of the Greek slave. Emotions of Beauty are called **Æsthetic**. You learn of a just or noble act; you admire and approve. You see the path of duty; you feel obligation to pursue it. Emotions accompanying moral acts are called **Ethical**. Finally, you see a prize before you which it is possible for you to attain, you earnestly long to possess it. Emotions of longing and craving are called **Desires**.

The Emotions	Egoistic Emotions...	{ Joy—Sorrow Content—Discontent Pride—Humiliation Satisfaction—Regret Hope—Fear etc.—etc.
	Altruistic Emotions..	{ Sympathy—Antipathy Love—Hate etc.—etc.
	Intellectual Emotions	{ Emotions of Curiosity Knowledge Emotions Truth Emotions
	Æsthetic Emotions..	{ Emotions of the Ludicrous Emotions of the Beautiful Emotions of the Sublime
	Ethical Emotions....	{ Emotions of Right and Wrong Emotions of Obligation Emotions of Approval and Disapproval
	Desires.....	{ for Existence " Property " Power " Superiority " Knowledge " Esteem

## EGOISTIC EMOTIONS.

**101. NATURE (123).** Egoistic or personal emotions spring from ideas that pertain to self. Possession of whatever seems desirable for the welfare of the individual gives rise to pleasurable feeling. Loss, deprivation or failure occasions painful emotions. An orator prepares a discourse on some theme of great interest, he enjoys the prospect of success and is confident and hopeful. When the occasion arrives he delivers his opinions with courage, and he is filled with an immediate emotion of just pride at their favorable reception. Afterward in retrospect he may view with satisfaction the good results of his conscientious and earnest advocacy of just principles. A man engages in some new business; he is fearful of the result and approaches his work with timidity. He fails and feels humiliated. In after-years he regrets his choice and his lack of vigorous enterprise. Egoistic emotions center in self. They are pleasurable in view of personal advantage; painful in view of loss. They are Retrospective, Immediate, or Prospective. The prospective emotions are accompanied by desire for future good. The personal emotions are the mainspring of action for self-interest.

**102. SOME IMPORTANT EGOISTIC EMOTIONS (123).** Joys and Sorrows fill a large place in human experience. They possess the minds of children and assume vast importance. Whatever children enjoy they want, often without regard to the wishes of others. In later years higher interests arise and subdue the petty joys and griefs that center in self. "Joy expresses itself in the levity, uplifting, of the features of the face ;

Sorrow in the gravity, the drawing down, of the features." **Content** arises when a person finds enough in his occupation and surroundings to employ his energies and satisfy his desires. **Discontent** is a painful sense of vacancy in one's life. This feeling may denote morbid and unreasonable desires which could not be satisfied by the realized fullness of human possibility. Pictures of content are fruitful themes for the novelist and the poet. **Pride** attends an exalted view of self. It makes one eager for excellence and sensitive if there is any real or apparent lack of commendable qualities. This feeling may become false and offensive and degenerate into Conceit or Haughtiness together with a depreciatory and unjustly low estimate of others; it is then a deforming vice. **Humiliation**, the opposite of Pride, follows some failure to attain our ideal standard; it is a painful feeling, and it may be useful as a motive toward effort. In childhood this painful emotion may be awakened by a kind of sympathy with the opinions of others. **Satisfaction**, a retrospective emotion, exists in view of a life well spent and success attained. **Regret** follows a neglect of opportunities and loss of any kind. Great success may lead to a high degree of satisfaction; extreme failure may cause terrible anguish at the memory of opportunities forever lost. **Hope** and **Fear** are eminently egoistic feelings in the child, although in advanced years they may be connected with sympathy for others. All that is desirable, all that furnishes pleasurable emotions, all that concerns our own welfare, if in danger of loss, occasions the painful emotions of fear, and the desire that the loss may be averted. Whatever is desirable as contributing

toward enjoyment, if there is possibility of attainment, awakens hope. Hope and fear constitute a large share of our pain and pleasure, and are powerful motives to action.

#### ALTRUISTIC EMOTIONS.

**103. SYMPATHY—ANTIPATHY (124).** Egoistic emotions terminate in self; emotions of Sympathy and all Altruistic emotions are directed toward others. In sympathy we share others' joys and sorrows. Sympathy implies the power to remember our own feelings and the power to imagine the feelings of the one with whom we sympathize.

Sympathy can not long be wholly one-sided. It is mutual in its nature and expects a response, a return. People who expect the sympathy of others must be able to enter into the thoughts and feelings of others.

Sympathy has great influence on the happiness and conduct of men. General opinion sways the individual and he may be carried along by the common sentiment, sometimes almost against his own judgment. Desire for sympathy influences people in their acts, and the better impulses of a person may often be strengthened by the giving or withholding of sympathy at the proper times.

The sympathy of children is awakened by some description that recalls a former experience of their own, also by the signs of joy or suffering in others which they are accustomed themselves to present under similar circumstances. Sympathy may be shown by a very young child. As our experience enlarges and we are able more readily to interpret the signs of emotion in others, our power of sympathy grows. The

joy or pleasure of those around us tends to create a joyous spirit in us; prevailing gloom dampens our own pleasure and leads us to share the common feeling. A high degree of sympathy exists when one is able to enter in a disinterested way into the plans and pleasures of others and to regard their interests and welfare. This bestowal of sympathy reacts to the happiness of the giver, and the man of sympathy may get much more enjoyment out of life than the selfish person.<sup>1</sup>

While Sympathy is emotion with and for others, *Antipathy* is emotion against and away from others. It may result from baseless prejudice or from real discord between temperaments and characters. Further consideration of Antipathy may be referred to the subject of Love and Hate.

**104. LOVE—HATE (124).** After a child has long been associated with things that produce comfort and pleasure, he acquires a fixed regard for them, enjoys their presence and suffers at their loss. Thus originates the love of home and of familiar scenes. The basis of the love of a child for those who minister to his comfort and contribute to his happiness is largely this

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<sup>1</sup> "That man may last, but never lives,  
Who much receives, but nothing gives;  
Whom none can love, whom none can thank,  
Creation's blot, creation's blank."—GIBBONS.

"Yet should some neighbor feel a pain  
Just in the parts where I complain,  
How many a message would he send!  
What hearty prayers that I should mend!  
Enquire what regimen I kept,  
What gave me ease and how I slept."—SWIFT.



selfish principle of liking what pleases ; a feeling of sympathy contributes to the intensity and completeness of the affection.

Regard for friends may open the way for the working of influence, and the love of a child may make easy the labor of instruction and guidance. The regard for the scenes of childhood and the tender recollections of early experience are some of the most sacred and worthy feelings of the human heart.

The different forms of Love are *Love of God, Conjugal Love, Love for Children, Love for Parents, Fraternal Love, Love of Friends* and *Love of Country*. Love is the foundation of all happy association of human beings. It is the social emotion. It reveals the genial nature. It attracts man to man and man to his Maker. The pages of the Poet and the Novelist are filled with the theme. This fact alone shows how profoundly the emotion in all its forms interests the human soul.

Whatever interferes with our own selfish enjoyment or our real or imagined rights, causing us to suffer some loss of enjoyment, whatever excellence in others makes us feel the pain of our own lack or deprivation, tends to awaken disagreeable feelings of resentment. These feelings may be classed under the generic term *Hate*. The rivalry of children in the attempt to outdo each other, the resentment at being deprived of play-things, the manifest feeling of pain and anger at seeing other children possess something which they do not, are examples. Real feelings of rivalry are unworthy of persons of mature judgment, because they do not refer alone to the enjoyment of one's own excellence, but they involve a desire of harm to others.

There may be, however, a feeling of emulation which is commendable ; such is the joy in accomplishing what others do, of measuring our powers with others, and of doing the best our powers and opportunities allow. Feeling of antipathy against those who needlessly and continually cause pain may be just. "Righteous Indignation" may at times prove useful.

Love usually involves the desire of good to the object, and Hate involves the desire of harm ; hence these feelings are often classed as *Benevolent* and *Malevolent*. If Love is the sunshine of life, Hate is its cloudy, gloomy and forbidding aspect. Pure Love ennobles ; Hate degrades.

#### INTELLECTUAL EMOTIONS.

**105. EMOTIONS OF CURIOSITY.** The earliest form of Intellectual emotion is the impulse of curiosity and the joy of its gratification. To the child everything is new and wonderful. He is eager to enlarge his world of ideas, and questions constantly arise, often to the discomfort of older persons, who are expected to find answers suited to the child's undeveloped understanding.

**106. KNOWLEDGE EMOTIONS.** Obscurity and confusion are disagreeable, while clearness and distinctness are pleasurable. "We are soothed by the solution of a riddle." There is conscious power in the grasp furnished by the inductions of science ;—a knowledge of causes clears up obscurity and doubt. The discovery of practical adaptation of means to an end also furnishes intellectual pleasure. In all departments of

study there is some degree of enjoyment. The gaining of new information awakens a sense of power. Every act of fine discrimination, every discovery of obscure similarity, every discovery of a cause, every development of a new truth through a reasoning process, every useful grouping of ideas, gives us a greater command of the field of knowledge, and is a source of enjoyment.

**107. TRUTH EMOTIONS.** After a high and refined development of intellectual emotions is attained, one may devote himself to the discovery of truth for its own sake, and the feeling of pleasure may involve no selfish regard for power or approbation. Robert Hall says—"The Author of Nature has wisely annexed a pleasure to the exercise of our active powers, and particularly to the pursuit of truth, which, if it be in some instances less intense, is far more durable, than gratification of sense, and is on that account incomparably more valuable. Its duration, to say nothing of its other properties, renders it more valuable. It may be repeated without satiety, and pleases afresh on every application of it."

**108. GROWTH OF LOVE FOR KNOWLEDGE (125).** As has been stated, desire for knowledge begins with the curiosity of the child; perplexity is a source of pain and urges the child toward a solution. In school, by a kind of sympathy, the value of knowledge is impressed upon the child's mind, and every sanction is given to devotion to the discovery of new ideas. After the pupil is able to judge for himself, he connects the acquisition of knowledge with the enjoyment of power, position, success, etc. Since by exercise every faculty is strengthened and habit is fixed, pleasure in pursuit

of knowledge may be developed by the actual exercise of the faculties, which creates a demand for the renewal of the exercise. A world of wonder lies about us. The law and order of the universe invite discovery; mysteries await solution. Man tries to think the thoughts of God after him. Devotion to the pursuit of truth raises man in the scale of being. Success thrills the heart with deep feeling of wonder and delight. Imagine the joy of Copernicus when he learned the true theory of the solar system, of Newton when he discovered the law of gravitation. No wonder men have withdrawn from the active world to contemplate with love and awe the wonders of creation. Men forget their sorrows by devotion to studies. Goethe is said to have sustained his spirit under a crushing sorrow by turning to a new and difficult study.

#### ÆSTHETIC EMOTIONS.

**109. NATURE. KINDS.** Beautiful and sublime objects, witty sayings, ludicrous occurrences, are the source of emotions called Æsthetic. These emotions serve for enjoyment and for refinement, but not for utility or action. These emotions are not awakened when anything painful or disagreeable accompanies the objects capable of producing them. As in case of a beautiful sunset or a fine painting or a flash of wit, their enjoyment is a common privilege. Accordingly Bain thus characterizes them: (1) They have pleasure for their immediate end; (2) They have no disagreeable accompaniments; (3) Their enjoyment is not restricted to one or a few persons.<sup>1</sup>

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<sup>1</sup> Bain, *Mental Science*, p. 290.

The emotions described are of many kinds and shades, but they are commonly classed under three heads: Emotions of *Beauty*, Emotions of *Sublimity*, and Emotions of the *Ludicrous*. *Ugliness*, *Insignificance* and the *Dull and Prosy* are opposites of Beauty, Sublimity and the Ludicrous; they awaken disagreeable emotion.

**110. EMOTIONS OF BEAUTY. NATURE OF BEAUTY.** The song of a bird, a sunset, the Sistine Madonna, the Greek Slave, Tennyson's "Brook," the devotion of a pure life, noble thoughts, are beautiful. You pause before a landscape; the eye falls upon stream, grove, and waving grain, all bathed in cheerful sunlight, and you exclaim, "How beautiful!" In presence of the Beauty-world the soul expands, exults; self is lost in contemplation of ideal perfection.

The problem of discovering some principle common to beautiful objects has always puzzled philosophers. Emerson says that, taking warning from the fate of many philosophers, he attempts no definition of Beauty. Bain says, "The search after some common property applicable to all things named Beautiful is now abandoned. The common attribute resides only in the Emotion." Dr. Samuel Harris, in "Philosophical Basis of Theism," Chap. X, notes a protest against this view. "Prof. Bain is mistaken when he says that the true idea has never been found. The æsthetic philosophy which teaches that beauty is the expression of ideal perfection *has long been held by profound thinkers. It meets all the conditions of the problem.* It gives a principle which explains all beauty by the element of perfection common to all beautiful objects, from a China cup to a Corliss engine, from a

painted flower to a Sistine Madonna or an Olympian Jupiter, from a violet or rose to the starry heavens and the Cosmos itself, from the innocence of a child's face to the character of Jesus and the perfection of God."

Among the things that contribute to emotions of Beauty we may note some that are familiar. There is a sensuous pleasure in a beautiful color, in light and shade, in melody and harmony. The perception of various qualities, as Symmetry, Adaptation in objects, adds to the pleasurable feeling: we say, "What a beautiful plan!" etc. Association of pleasant memories and symbolic ideas or sentiments may very much heighten the feeling of Beauty. Other emotions, as those of Novelty, Surprise, Wonder, may strengthen the emotion of Beauty. The things which may contribute to emotions of Beauty are: (1) Sensations, (2) Intellectual perceptions, (3) Association of memories and symbolic ideas, (4) Enhancing emotions of other classes.<sup>1</sup>

As to whether Beauty is subjective or objective, i.e. existing in the mind or in the object, there has always been much discussion. The simple fact is that there are certain things in Nature and art and certain sentiments capable, when presented to the mind, of awakening æsthetic emotion. In no practical sense can Beauty be said to exist without the mind or without the object. It is the conjunction of the two that produces the result. But it is proper and convenient to ascribe the Beauty to the object awakening the emotion.

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<sup>1</sup> Compare Spencer, Vol. II, Part IX, Chap. IX; Sully, p. 537; Bain, Mental Science, p. 293; McCosh, The Motive Powers, p. 151.

**111. BEAUTY IN ART AND NATURE.** Beauty usually appeals to the eye and the ear. It is found in symmetry of form, harmony of color and sound. The architect, using the forms of Nature which are pleasing to the eye, fashions a temple full of symmetry, order and adaptation. The grace of outline, the ideal proportion, the embodiment of typical ideas, furnished by the sculptor, may awaken deepest emotion. The Painter uses not only outline and figurative expression of idea, but adds harmony of color. The artistic arrangement of sounds in music stirs the heart with tender or deep emotion.

Poetry charms not only by its rhythm, by its skillful arrangement of thought, by its word-painting, by its figurative expression, but also by touching the chords of that which is sacred and tender. Patriotism is essentially a poetic sentiment. We love old scenes for their sacred associations. Historical places,<sup>1</sup> mementos of friendship, tokens of regard, are clothed with poetic sentiment and invite contemplation.

The Æsthetic feeling had its first exercise in contemplation of Nature. Here we find Objects of Wonder, Forms of Beauty, Perfection of Color, Variety of Arrangement, Unity of Design—all those elements that tend to please and satisfy the æsthetic taste. Nature has every mood and is full of figures of ex-

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<sup>1</sup> "And hence the charms historic scenes impart;  
Hence Tiber awes, and Avon melts the heart,  
Aerial forms in Tempe's classic vale,  
Glance through the gloom, and whisper in the gale;  
In wild Vaucluse with love and Laura dwell,  
And watch and weep in Eloisa's cell."

ROGERS, *Pleasures of Memory.*

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pression for all our ideas. The contemplation of Nature brings us nearer all that is beautiful and good.<sup>1</sup>

**112. TASTE.** We have not only the power to enjoy objects of Beauty, but we can use the judgment to detect that which pleases in any object, and we can point out violations of Æsthetic principles. The power of the child to discern Beauty, crude at first, grows by observation of beautiful objects, and is trained by the appreciation of others.

There is a great variety of tastes, but there is, nevertheless, a practical standard for Beauty. There are certain works of art, certain great poems, that have always commanded the highest regard from all educated and cultivated people. Where there is any very general agreement of this kind, there may be said to be a standard of taste. We take for our models of beauty those things which are most pleasing to the refined. We judge writings by comparing them with the accepted works of standard authors, the sculpture of the human form by comparing with the Apollo Belvidere or the Venus de Milo; by the comparison we are able to discover the fault of a less artistic production.

Since there is in taste an element of judgment, we may define thus: **Taste** is the discriminating power of the mind in regard to Wit, Beauty, or Sublimity. Since both judgment and feeling are concerned in taste, we may vary the definition. **Taste** is the power to perceive and feel whatever is Beautiful or Sublime in Nature and Art.

**113. EMOTIONS OF SUBLIMITY.** Akin to emotions of Beauty are those of Sublimity. While *Form* is an

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<sup>1</sup> Read McCosh, *The Motive Powers*, p. 164.



essential element in *Beauty*, *Magnitude* is an essential element in *Sublimity*. The ocean, vast plains, lofty mountains, the starry heavens, are sublime. We may speak of a sublime action or motive from the grandeur of purpose, will, or effort exhibited. This emotion partakes of awe and is perhaps not always altogether pleasurable. As a constant source of enjoyment, Sublimity is less satisfying than Beauty, because the mind is incapable of remaining long on that elevated plane.

**114. EMOTIONS OF THE LUDICROUS.** It seems that man alone discovers those incongruous relations of ideas and things which excite laughter. Man may be defined as a laughter-loving animal. A sense of the ludicrous arises when whatever is lofty or pretentious is humiliated, provided emotions of sympathy are not aroused. Things which do not naturally belong together are brought into juxtaposition, as when a dude accidentally slips into the gutter.<sup>1</sup> **Incongruity is the basis of the Ludicrous.** Bain says, "The occasion of the Ludicrous is the degradation of some person or interest possessing dignity, in circumstances which excite no stronger emotion."

The two chief classes of the Ludicrous are Wit and Humor. Humor is not of a marked character, but consists in a less striking incongruity of ideas which pleases, often without exciting laughter. Humor may be sustained, as in the novels of Dickens, and become a gentle all-pervading influence. Humor pleases but does not hurt. Good-nature is a characteristic of

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<sup>1</sup> Read McCosh, *The Motive Powers*, p. 156.

humor. Wit sparkles, its soul is brevity. It is quick and incisive and may be so aimed as to wound.

**115. GROWTH OF ÆSTHETIC EMOTIONS** (126). The laughter of children is an overflow of animal spirits rather than the result of any discovery of ludicrous relations. As much refinement is possible in the sense of humor as in the sense of Beauty.

Pleasure in the sensuous element of beauty is the first experienced by the child, as the enjoyment of bright colors or musical sounds. All matters of taste in dress, of care about the home or in the school-room, beautiful tales, poetry, cultivate the sense of Beauty. It is by practice that the susceptibility and discriminating power are developed. By studying Beauty in Nature and works of art, by a sympathetic acquaintance with artistic effects in the masterpieces of literature, the emotional power may be strengthened and refined.

#### ETHICAL EMOTIONS.

**116. NATURE. CLASSES.** The Ethical or Moral Emotions spring from ideas of right and wrong; they refer to our moral conduct; they are concerned, not with what we may wish to do, but with what we ought to do. (1) I read of the deeds of Aristides and see them to be right; I experience a feeling of pleasure. I review the life of Nero and see his deeds to be cruel; I experience a feeling of pain. (2) You are tempted to lie because thereby you will reap some temporary advantage; you perceive an obligation resting upon you and you feel an inward prompting, an impulse, an emotion of obligation to act the truth and avoid

falsehood. (3) Your neighbor restores property wrongly obtained; you see it to be a meritorious act and feel approval. An unscrupulous schemer cheats a poor man; you perceive the demerit of the act and feel disapproval. We are able (1) to perceive Right and Wrong and to experience the corresponding feelings; (2) to perceive Obligation and to feel Obligation; (3) to perceive Merit or Demerit and to feel Approval or Disapproval.

117. **CONSCIENCE**<sup>1</sup> (127). The essential element of Conscience is *Obligation*, both the Perception and the Feeling. Conscience is often defined with reference to the intellectual element only, as follows: Conscience is the discriminating power of the mind with reference to Right and Obligation. Or, since both feeling and judgment are elements, we may thus define: Conscience is that which perceives and feels Right and Obligation.

The child learns that some acts of others are harmful to himself and observes the effect of similar conduct toward others. Whatever unpleasantly affects himself, he resents as wrong, and by sympathy he learns to view his own ill conduct toward others in the same light; so the conduct of another person toward a third comes to be regarded as right or wrong and the abstract idea of Right and Wrong is developed. Early education has much to do with the idea of right and the feeling of obligation. The admonition of parent or teacher, the requirements of the law, the approval or condemnation of a community, since

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<sup>1</sup> "Two things there are, which, the oftener and the more steadfastly we consider, fill the mind with an ever new, an ever rising admiration and reverence;—the STARRY HEAVEN above, the MORAL LAW within."—KANT.

they bring feelings of pain or pleasure to the individual, give a sanction to certain things, and create a dislike for others. In a community where an unselfish idea of action did not exist the growth of moral perception and emotion would be slow and imperfect.<sup>1</sup>

Practice the right, give free play to moral feeling; habit helps make character. Yield to the higher and better impulses; they guide toward the greatest good and happiness. Shakespeare well shows the value of habit in creating moral tendency.

*Queen.* O Hamlet, thou hast cleft my heart in twain.

*Ham.* O, throw away the worser part of it,  
And live the purer with the other half.

Assume a virtue, if you have it not.

For use almost can change the stamp of nature,  
And either shame the Devil or throw him out  
With wondrous potency.

**118. STANDARD OF CONSCIENCE. BINDING FORCE OF CONSCIENCE.** No doubt there have existed in different ages

<sup>1</sup> "Conscience grows as the oak grows. As the tree needs earth in which to root itself and the air of which to breathe, so the conscience needs a seat in our mental nature, with a stimulus to make it germinate and expand. All along it is so far swayed by its surroundings. Its health will depend on the climate. When reared in a bare soil, it will be dwarfish. When exposed to cold and blighting, it will be stunted and gnarled. In a good soil and a healthy atmosphere, it will be upright and well-formed. In particular, it grows and spreads out with the intelligence which enables it clearly to apprehend facts and to discover the consequences. All this may be admitted, while we hold that the moral power could not have been produced without a native moral norm any more than a plant or animal could have been produced without a germ."—McCOSH, *The Motive Powers*, p. 224.

and countries varying opinions of right and wrong. No doubt many things may seem right to one which seem wrong to another. But amid all this diversity of judgments as to what is right, the voice of conscience is constantly saying—"Intend the right; conform to obligation; <sup>1</sup> your duty is to do all you can to learn the right, and to perform all the right you know." However conduct may vary in different individuals, and in countries of unequal degrees of light, yet in regard to what motives ought to be obeyed there has always been substantial agreement.

What any one may think about the origin of conscience does not invalidate its binding force. Not only the law of God but the better sense of mankind teaches the Golden Rule. It is in the nature of things that men should imagine themselves in the place of their neighbors; and, if they would attain the highest growth and happiness for themselves, that they should endeavor to do as they would be done by. The joy in well doing and the remorse for evil are common and important feelings. They offer striking and extreme contrasts; on the one hand serene joy, on the other the darkness and horror of despair.<sup>2</sup>

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<sup>1</sup> "Beware how you put the finger of special pleading on the quivering needle of conscience, and forbid it to go north, south, east or west; beware of failing to balance it on a hair's point; for whoever tutors that primordial, necessary, universal, infallible perception, tutors a personal God."

<sup>2</sup> "It is proverbial that an evil conscience makes a man a coward, for he does not know when some one may charge him with his sin, which he must either confess to his humiliation or deny with a lie, and he feels that he has no inward strength to fall back upon. On the other hand, a good conscience gives a man

## DESIRES.

**119. THE DESIRES.** The possession of property, the prosperity of your friend, the acquisition of knowledge, a beautiful painting, give you pleasure; you desire these things. The loss of property, the misfortune of a dear relative, conscious ignorance, ugly and distorted objects, give you pain; you desire to avoid them. **Whatever gives pleasure we desire; whatever gives pain we desire to avoid.** Desire is a craving for what will afford satisfaction. Did property afford no pleasure, were you totally indifferent to the beauty of a fine statue, these things would awaken no desire. **Desires are based upon and accompany the feelings.** There is pleasure in Existence, beyond is uncertainty and doubt from which we shrink. Property furnishes comfort, security and gratification, we enjoy it and fear its loss. Power increases our freedom and means of enjoyment, and it is an object of desire. Superiority carries with it a sense of agreeable contrast, of freedom and power. Knowledge clears away doubt and obscurity and is a source of power. Knowledge

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courage to resist the evil when it is coming in like a flood, and to stand by a good cause when friends, companions, the whole world may be against him."—McCOSH, *The Motive Powers*, p. 219.

"A peace above all earthly dignities,  
A still and quiet conscience."

"O coward conscience, how dost thou afflict me!—  
The lights burn blue.—It is now dead midnight.  
Cold fearful drops stand on my trembling flesh.

My conscience hath a thousand several tongues,  
And every tongue brings in a several tale,  
And every tale condemns me for a villain."

in some form is an object of universal desire. Children early look to elders for approval and are pained by disapproval; all persons are influenced by the opinion of others; the desire for Esteem is a part of our nature. Some important desires are those for Existence, Property, Power, Superiority, Knowledge, Esteem. The desires will be further studied in connection with the Will.

### APPLICATIONS.

**120. SELF-ACTIVITY. THE PRINCIPLE OF NOVELTY** (94, 95). The natural exertion of our powers is pleasurable. This is the source of self-activity. Self-activity is to be fostered by every means; this is true education. Lack of intellectual energy in pupils is often the fault of teachers. If the teacher acts as an inspiring guide and the powers of the pupil are not overtasked and his mind is not confused by inappropriate tasks, the consciousness of growth in mental power may act as a pleasurable incentive. In youth the anticipation of future enjoyment of power, influence and usefulness, resulting from his education, may lead one to the pursuit of studies in themselves indifferent.

If novelty increases the intensity of emotion, monotony, on the other hand, dulls the sensibility or rather fails to awaken it. Change is necessary to intensity of emotional life. It follows that any method of discipline which never varies will lose much of its force; constant punishment or harshness, even constant praise, finally lose their effect. Frequent change of work is necessary for young pupils. This principle has already been stated in connection with the subject of Attention.

**121. THE PHYSICAL FEELINGS IN RELATION TO EDUCATION (98).** The child is vividly conscious of his bodily feelings; his positions, his hunger, his thirst, his feeling of warmth or cold are uppermost in his mind. He understands motives that affect his bodily comfort or discomfort. It results that physical pain as a means of discipline has a philosophical basis. Infliction with the rod may produce a salutary effect when a needed result can not be reached through the emotions. Some deprivation that produces bodily discomfort may also be employed. But one great work of education is to make the child forget his bodily conditions, to teach him to live in the world of thought and emotion. Home and school discipline which refuses to gratify every whim that has a physical basis has a most salutary effect. But as soon as possible, in discipline, fear of physical pain must be supplanted by appeals to higher motives. Only in this way can noble character be developed.

**122. THE PRINCIPLES OF THE EMOTIONS APPLIED TO EDUCATION (99).** Since action depends upon emotion and there is a great variety of emotions, some good and some bad, the cultivation of some emotions and the repression of others is one great work of instruction,—a work which has an important bearing on the character of pupils and their success in life.

The signs of wrong emotion, as exhibitions of anger, fretfulness, selfishness, are to be repressed. Listless pupils, those who seem to find no interest in any thing, lack emotional power. They need awakening through the emotions. Some way should be found to ripple the stagnant waters. Some kind of activity once aroused may lead to activity in useful studies.



Emotion grows by habit. Every fit of anger, every act of sympathy, every exercise of the higher emotions of Beauty and Knowledge, tends to the formation of good or bad emotional character. The formation of emotional habit is to an extent in the hands of the teacher. There is a great variety of temperaments among children, depending upon the absolute and relative intensity of emotions. He who would know the problems of education must understand the varieties of emotional nature. Highly emotional children need to be treated with peculiar skill by parent and teacher.<sup>1</sup>

**123. EDUCATION OF THE PERSONAL EMOTIONS'** (101, 102). The satisfaction and pride which accompany the esteem of others, lead us to desire esteem. Approbation is not only a source of gratification to the recipient, but it may be used to encourage those lacking in confidence or in desire for excellence.

A certain self-confidence and self-respect must be possessed by the pupil; in some this must be cultivated, while in others it must be repressed. Proper self-esteem, genuine pride, are desirable. By pointing out what is excellent in character, by approving that which is good and contrasting it with less desirable traits, the desire for worthy traits of character is cultivated. When self-esteem and pride become excessive or false, they may be corrected by punishment or humiliation of some kind. These feelings are often dulled by inconsiderate treatment. As a means of discipline censure which occasions a painful feeling of humiliation

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<sup>1</sup> Read Ladd, p. 576, on "Temperaments;" McCosh, *The Motive Powers*, p. 178.

<sup>2</sup> Read Richter's *Levana*, p. 339, § 116; p. 341, § 117.

can by no means be avoided. It is frequently the readiest and best method of reaching a result.

Hope stimulates, fear tends to paralyze. Timidity and fear need to be supplanted by confidence and hope. The kind of fear to cultivate is that of giving offense or pain—the fear of doing wrong. Righteous indignation, without loss of self-control, however, is sometimes needed to impress a lesson through fear upon a persistent culprit.

**124. SYMPATHY. RIVALRY** (103, 104). Habitual harshness toward children makes them in turn regardless of the feelings of others; exhibitions of kindness toward them create a disposition of sympathy for others. Kindness begets kindness. Sympathy and love are important as a basis for effective influence for good. Sympathy between teacher and pupil makes the work of all instruction and moral influence easier and more effective. The sympathy of others encourages our endeavors.

The feeling of sympathy may be cultivated by relating incidents of suffering and need and relief; by calling attention to the results of unkind and inconsiderate acts, and to the happiness occasioned by kindly acts. Calling attention to the good qualities of others, speaking well of others, and cultivating kind and generous acts toward others, entering into the feelings of others, will tend to correct malevolent feelings and encourage sympathy.

Studies should not be pursued in a spirit of rivalry, but with a love of knowledge and a desire for real excellence. Prizes are usually harmful in some way. Rivalry in a school, where so many are striving for approbation and distinction, invariably springs up.

It may be diminished by making prominent more worthy motives. Habits of anger indulged may give cast to character for life. Nothing is better than the influence of parent or teacher who gives no exhibition of such feelings. An even temper and quiet bearing impress themselves on all with whom one may come in contact; children reflect the feelings of others.<sup>1</sup>

**125. DESIRE FOR KNOWLEDGE (105-108).** Curiosity is natural, and, as has been said, pleasure follows the discovery of agreements and differences in objects of thought. The manner in which subjects are presented determines to a degree the pleasure of study. When the faculties are permitted to act naturally, when one step follows another in a clear path, there is a probability that the child will be eager to pursue the work. The desire for knowledge, however, usually depends much upon feelings of emulation, desire for approbation, and desire for future good. But the love of knowledge may become an absorbing interest and one may learn to devote himself to the discovery of truth for its own sake.

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<sup>1</sup> "The more delicately we treat the sensibilities of children, the more refined do they become; the more rudely, the more blunted. A coarse teacher makes a coarse child. It is possible to produce such a condition of sensibility among pupils that a word of disapproval is a sufficient punishment; and it is also possible to produce such a state that loud scolding and perpetual blows are wholly ineffectual in maintaining even the rudiments of order. What proceeds from reason and gentleness inspires reasonableness and love; what proceeds from irritation and physical force provokes irritation and a physical response. Ideas hide and react upon the conduct; blows sting for a moment and leave little behind but fear and resentment."—HILL.

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**126. MEANS OF CULTIVATING THE ÆSTHETIC EMOTIONS (115).** All points of neatness about the house or schoolroom, care in the performance of work, pictures, etc., are the first practical means of awakening a pleasure in beautiful things and a disgust for the opposite. Drawing and singing in school work do much to develop taste.

The right study of poetry, and fine literature in general, tends to the same end. Calling attention to points of beauty in art, indicating the variety of things in nature that are pleasing to the eye or ear, cultivate the æsthetic feelings. Much of the happiness of life may consist in the enjoyment of æsthetic pleasures.

**127. EDUCATION OF THE MORAL FEELINGS (117).** Sully makes the development of the moral feelings depend upon (1) Authority; (2) Sympathy, Love, Respect; (3) Companions, Surroundings; (4) Moral Instruction.

We can not expect that children will always choose that which is right, wisest or best, unless put under some restraint or compulsion. The law, to be respected, must have its penalties. Right is made right in the minds of many by the very estimate put upon it by those who enforce it. Exact obedience, required in a spirit of kindness, helps to cultivate the moral sentiments and guides weak natures in spite of their own inclination in the path of right, justice and ultimate highest good.<sup>1</sup>

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<sup>1</sup> "Herbert Spencer's doctrine of punishment [that of natural consequences] would permit boys to fall from high places, to breathe bad air, to poison their blood by the use of tobacco, and *take the consequences*, which he fancies would be more wise and just than the employment of artificial punishments."

Sympathy enables us to reach the will of a child and influence him toward proper conduct. Those whom children love and respect they fear to offend, and the benevolent feelings in general counteract the tendency to indulge malevolent feelings.

Lax moral notions at home, in the school or in the community, are unfavorable to the growth of moral feelings in a child. Companions have a powerful influence on young natures; they are not strong to stand against prevailing sentiment in school or elsewhere. It is important that good sentiment prevail in a school, and that the child's companions and social surroundings be such as to exert good influence.

Moral instruction has a value. A principle of conduct firmly established acts as a guide in practical affairs. But mere instruction, "preaching," is not sufficient. What the child should do, he must practice. The abstract notion of right does not profoundly influence us. Teach the child to perform kind, unselfish, just acts; to be frank, open, truthful; to avoid mean, dishonest, insincere traits. From the practice spring ideas of right; emotions of Right accompany the ideas, and character is thus firmly established.

Finally, no person can afford to violate his own inner sense of justice. The wrong to one's self from a fault is often greater than to the one injured. Even from a practical point there is a difference in the nature of things; some acts tend toward refinement and satisfaction and happiness, others in the opposite direction.

**EXERCISES.**

1. Define each activity of the Intellect. Define Feeling.
2. Give some illustration of the fact that knowledge precedes emotion.
3. Mention some emotions that prompt to useful action.
4. Explain indisposition to effort.
5. Effect of monotony upon the emotions ; of change.
6. Give some illustrations of the principles of Harmony and Contrast in relation to emotional intensity.
7. Why are sensations called physical feelings? Analyze Hunger.
8. Define Instinct, Appetite, General Sensation, Special Sensation.
9. Describe the origin and growth of some emotion.
10. Imagine a human being with no emotions.
11. Mention some Retrospective Emotions ; Immediate Emotions ; Prospective Emotions.
12. Define Egoistic Emotions ; Intellectual Emotions ; Altruistic Emotions ; Æsthetic Emotions ; Ethical Emotions.
13. Of the personal feelings what ones should be cultivated ; what ones repressed ?
14. Mention other species of Egoistic Emotions.
15. Mention some emotions in view of success ; in view of failure.
16. What emotions may we ascribe to Grant in view of his military success ; to Napoleon at his overthrow ?
17. Analyze an act of Sympathy ; of Hate.
18. Define emotions of Beauty ; of Sublimity ; of the Ludicrous.
19. Mention the painful Æsthetic Emotions.
20. In view of what do painful Æsthetic Emotions arise ?
21. Give a good illustration of Humor ; of Wit, pointing out in the example in what the wit consists.
22. Define Pun, Burlesque, Satire, Sarcasm.
23. Mention any building, piece of statuary, painting, piece of music, or poem which possesses beauty in a marked degree, pointing out any elements which contribute to the effect.
24. Analyze an act of conscience.

25. Analyze some desire.
26. How is self-activity fostered?
27. Sum up the means that may contribute to the growth of sympathy.
28. Can the pursuit of knowledge be made always agreeable?
29. Would it be a safe practice never to inflict physical pain as a means of discipline?
30. What general principle of education may be drawn from the fact that all emotions are agreeable or disagreeable?
31. What is the effect upon the young of examples of selfishness, cruelty, dishonesty, etc.; of their opposites?
32. What is the natural effect of indulging frequent outbursts of anger?
33. Give a general estimate of the importance of surroundings in educating the moral sentiments.
34. Why is moral instruction an important means of moral training?
35. Why is concrete instruction more effective than abstract?
36. What is the value of maxims in moral training?
37. Of two motives equally effective in securing immediate results, which should be used, the higher or the lower? Why?

## WILLING.

**128. NATURE OF WILL; ELEMENTS.** Every one is conscious of a power to act whenever some motive for action is presented to the mind. This power is exerted toward something desirable, if it seems possible that the thing desired can be attained. Will is the power of the mind to exert conscious action toward some end.

Every one is acquainted with the terms *Desire*, *Deliberation*, *Choice*, and the mental phenomena which they indicate. *Non-Voluntary Action* may be defined as action in which conscious decision and directive effort of the mind are wanting.

In order to understand the relation of Will to the other mental powers and the relation of the elements of will to each other, let us imagine a case. I enter an art gallery and view a beautiful painting; I study the conception which it embodies, the details of execution, and acquaint myself with the name of the artist. I experience a feeling of delight at the perfection of the work, and imagine what pleasure might come to me and my friends from the possession of the painting. A strong desire to purchase follows and, returning home, I deliberate upon its advisability; this deliberation results in a decision to buy; the next day I carry my choice into effect. Here is an exercise of the three powers, Knowing, Feeling, and Willing. The knowledge of the painting preceded the



emotions, the emotions preceded the Act of Volition. **Knowledge** precedes and gives rise to **Emotion**; **Emotion** precedes and gives rise to **Acts of Will**. No amount of *knowledge* of the painting would have led to action, unless *emotion* had been awakened, hence the emotions are said to stand between knowledge and volition.

Referring again to our illustration, Desire was the first element leading to action; if no desire had been awakened by the emotion, action could not have followed; it is the nature of emotion, however, to be accompanied usually by desire. Upon the desire the Deliberation, Choice and Execution naturally followed in the order stated. **The Elements associated with and including an act of will are Desire, Deliberation, Choice, Executive Volition.**<sup>1</sup>

**129. DESIRE AS MOTIVE.** Emotions are either pleasurable or painful; we seek that which produces pleasure and avoid that which produces pain. While experiencing a pleasure, we desire its continuance; if the experience is painful, we desire change. If we picture in our minds some good which we do not possess, we may feel a lack, a desire to attain it, and

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<sup>1</sup>*Choice and Executive Volition* are the characteristic elements of a complete act of will. Desire is feeling, Deliberation is intellectual, while Choice and Execution are the active and decisive elements following the desire and deliberation.

Not all these elements are prominent in every act of Will. Following some pleasant or painful experience action may occur by a quick impulse, hardly leaving time for conscious desire or deliberation or choice, yet these elements are consciously present in all "deliberate" acts.

The acts summed up as *non-voluntary*, I think should be excluded from Will proper, although some of these acts may contain the germs of Will,

if we think the attainment possible the desire may lead to action. That which is disagreeable, if not present yet likely to occur, we desire to avoid, and this desire also may lead to action. Emotions are agreeable or disagreeable. We desire that which occasions agreeable emotion ; we desire to avoid that which occasions disagreeable emotion. Desire is the motive which leads to action.

A child first makes voluntary effort in view of some object which he remembers to have furnished enjoyment. After a time what has furnished pleasure in the past, even when not present, is remembered and projected into the future as something desirable. The imagination may picture a possible means of good in the future. Children desire present enjoyment ; they do not act with reference to the future because their stock of representative images is small, and they are unable to picture remote results vividly. Representation is a condition of Desire. In childhood a representation attaches itself to a present object, later it is projected into the future.

When the mind is developed, is well stored with images of memory, is able to look ahead and see what action may lead to good results, the desires that may arise and exist as motives to action are very numerous ; amongst these desires there is often a conflict and a victory of the strongest. Malevolent and kindly feelings may struggle for the mastery ; selfish and sympathetic emotions may oppose each other ; the desire for future good and inclination for present enjoyment may offer their claims,—in short there may be as many desires or motives as there are objects of interest. When two or more motives present their

claims at the same time, the elements of Deliberation and Choice may become prominent. The choice may be made with reference to a course of action extending over a long period, or with reference to a remote act so that the Executive Volition, the final act, may be postponed for a long time. Motives are numerous. Motives oppose each other. In view of opposing Motives, Deliberation and Choice are employed. A Choice may be made with reference to an immediate act, to a course of action, or to a remote act.

The two most important classes of Motives which frequently oppose each other are Sense of Obligation and Selfish Desire. As learned under the "Moral Emotions," we naturally feel an obligation to choose that which, with reference to future results, our judgment approves as best; also, to act according to a sense of Right. At the same time present inclination or selfish desire may solicit us. The most important conflict of motives is between Obligation and Selfish Desire.

**130. NON-VOLUNTARY MOVEMENTS.**<sup>1</sup> There is a large class of movements which involve no action of the Will; there are other movements which involve such a slight degree of Will as to be called Non-Voluntary. (1) The nervous system from its store of vital force gives rise to purposeless movements. Many movements of young children, impulsive or unconscious changes of position when a person is in full vigor of

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<sup>1</sup> Read Sully, pp. 593-596; Carpenter, § 79.

The following are modes of Non-Voluntary activity: (1) *Reflex Action*, already explained; (2) *Sensori-Motor Action*, as when one *consciously* but without intention withdraws his hand from a hot stove; (3) *Ideo-Motor Action*, as when spontaneous laughter follows an incongruous idea.

health, are of the character mentioned. (2) Many acts are reflex, as unconscious rubbing of the hand when it is slightly irritated, involuntary winking when some object approaches the eye, starting at some sudden sound, walking or playing an instrument when the attention is upon something else. Many such acts emanate from the sub-conscious region, and there is little or no conscious exertion of will. (3) The movements of a child are at first largely instinctive. It acts according to inborn tendencies to meet its physical wants, has a natural instinctive timidity and reaches impulsively after attractive objects. **Random, Reflex and Instinctive movements may be regarded as Non-Voluntary.**<sup>1</sup>

**131. DEVELOPMENT OF WILL** (136, 137, 138, 139). With the child random, reflex, and instinctive movements are the first exercised. Random movements resulting from vital energy are pleasurable; reflex movements, as changing uncomfortable positions, furnish relief; instinctive movements, as looking at

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<sup>1</sup> Carpenter would add to the class of non-voluntary acts—"We see that, even in Man, intellectual operations of a high order may go on *Automatically*,—one state of consciousness calling forth another in strict accordance with the 'laws of thought' without any volitional interference; and also that *ideational* as well as *emotional* states may express themselves in Muscular action, not only without any exertion of the will, but even in opposition to it."

"*Automatic* motions are such as, without any corresponding idea or fiat of the will, originate from inner excitations of the central nervous system; the *reflex* are those in which the central excitations resulting in motion are traceable to the action of sensory nerves which have been peripherally excited."—LADD, p. 526.

a bright object or reaching after it, are a source of pleasure. **Spontaneous movements accidentally bring pleasure or relief, are prolonged or repeated until an association is formed between the movement and the result.**<sup>1</sup>

By observing others the child naturally learns to imitate their acts, and this constitutes another stage in the growth of will.

Before the judgment is developed, children must perform some acts and avoid others because they are so directed. The will of the parent is substituted for the will of the child; the child obeys either instinctively or through fear or love. Thus the power of self-control is educated.

Later, motives of many kinds become the basis of action, and, if the natural tendencies of the child are right, if the surroundings are desirable, and wise influence is employed, his will may become a power to guide him toward all that is highest and best.

**The means through which Will Power develops are Non-Voluntary Movements with their accidental associations, Imitation, Authority, Motives.**

**132. WILL AND HABIT**<sup>2</sup> (137, 138). Bodily habit may be so strong as to resist for a time efforts of the Will to correct it. Executive Volition, acting as it does through the nerves and muscles, creates a physical tendency to perform again a given movement. After a time the movement requires less Will and the physical tendency may finally become so strong as to successfully oppose the Will. The relation between the Will and the Body is very intimate. By the directive

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<sup>1</sup> See Bain, Bk. IV, Chap. II.

<sup>2</sup> Read Carpenter, §§ 290-293.

power of the Will tendency to physical action is formed which tendency may react upon and influence the Will. Hence the importance which is attached to *Regularity* and *Order*. The child which is hushed to sleep at night expects that attention and cries for it. The habit of falling asleep naturally without such attention is quite as readily formed. Regular hours for sleeping and for taking food are important to the child. The required positions and movements of the school-room, gymnastics, etc., render physical action and restraint easier, and open the way for the influence of authority. Such habits are useful, but habit may become so prominent as to interfere with the intelligent activity necessary to the formation of character.

Imitation contributes to the growth of the will. The atmosphere in which a child lives does much to form his tendencies. If duty is the ruling motive of action, as shown by all the daily incidents of the home circle, if sentiments of justice and right prevail, if sympathy and love control the intercourse, the child by unconscious imitation of his elders and companions will form habits of the highest worth in the growth of character. By unconscious imitation, benevolent and moral emotions and consequent good desires and tendencies may become habitual.

The principle of habit extends to all acts of will. Decision for or against a course of action tends to make the next decision easier, if the motives remain of the same kind and intensity.

**133. SELF-CONTROL.<sup>1</sup> CHARACTER. INFLUENCE.** Since motives lead to acts of will, can we control our action?

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<sup>1</sup> See Bain, *Mental Science*, p. 344; Carpenter, §§ 330-332; Harris, *Philosophical Basis of Theism*, pp. 378-384.

We may answer : We are conscious of a power to refrain from executing our impulses, i.e. to refrain from bodily action. Emotion may be suppressed by effort of will. It is well known that, if we restrain the impulse to give outward expression to anger, the emotion is lessened. This is done by a strong effort of will. It is an apt description to say we "swallow our wrath." Constantly many an impulse to wrong-doing is restrained as unworthy. Again, We may use the power of Attention to direct the mind away from unworthy motives and toward worthy ones. Knowledge precedes Emotion, and we have already learned that the Attention may be directed at will to this or that object of thought. Whatever knowledge leads to unworthy emotions and desires may be discharged from the mind and the attention may be fixed upon something else. As just explained, we can banish some emotions and leave room for others to hold sway. By persistence in giving the thoughts to worthy, elevating and ennobling things, the nature of motives may gradually be changed and the whole tendency of character may be modified. When desire and duty habitually act in the same direction, little energy is wasted in conflict of motives and the individual possesses practical freedom of will.

The term Character is used in a loose way to mean any distinguishing traits, good or bad, but in a limited sense it means that sum of traits which constitutes good character. Many epithets are used to indicate the degrees of excellence or strength of character. We understand that a person possesses a good character if his predominant motive is **THE RIGHT**. If a man always measures his proposed acts by high standards of Justice, Kindness, and Prudence, he is sure of his motives

and is not likely to go astray in his conduct.<sup>1</sup> No consideration should permit one to depart from those standards. Selfishness and Policy as leading motives of conduct expose one to the just contempt of all good men.

A knowledge of the different kinds of motives acquaints us with the avenues of approach to the will of others. Fear, Selfishness, Pride, Love, Desire for comfort and for respect, Sense of Right, are motives through which men may be influenced. An appeal to sense of duty may frequently strengthen that motive so far as to make it the prevailing one. Pride or Prudential Considerations may influence one when other motives fail. It is said that no one is so far lost to better motives, that some hidden source of good impulse may not be found. Recollections of childhood may open the floodgates of tender emotion until it again pervades the being of one seemingly hardened in unworthy conduct.

**134. PERSEVERANCE. FIRMNESS.** There are certain characteristics of will most desirable to possess. A person who is able to choose a worthy aim, to decide what, upon the whole, is the best course of conduct, and is willing to waive present enjoyment and all minor considerations until the end is attained is said to possess *Perseverance*. Perseverance is the greatest element of success. A little day by day,—the years

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<sup>1</sup> "The highest exercise of the Will is shown in those who are endowed with vigorous Intellectual powers, and whose strong Emotional nature gives force to all their tendencies to action; but who determinately fix their attention on the *divine ideal* and steadily endeavor to shape their character and direct their conduct in accordance with it."—CARPENTER.



go swiftly,—and by and by great advancement has been made.

Even when a course is seen to be the best, some men's minds are easily swayed by fear or by desire for popularity. The will which can adhere to a purpose in difficult circumstances possesses the quality of *Firmness*.

**135. FREEDOM OF WILL.** The much vexed, much discussed, and unsettled question of the Freedom of the Will demands a passing notice. Whatever metaphysical discussion or scientific investigation may seem to reveal as to the Nature of the Will, there are some practical facts not to be ignored. The Civil Law holds men responsible for their acts; Conscience holds men responsible for their acts; the Law of God holds men responsible for their acts; and we all believe from our own inner consciousness that we can act as we please. Even if the Will is not free, practically we must act as if it were free. There is a choice of motives; he who chooses best chooses wisely.

The arguments commonly used against Freedom of the Will are these: (1) We must choose in view of the strongest motive, and we can not control our motives. (2) No event is without cause, therefore an act of will is caused. (3) If the will were free, i.e. if its acts were self-caused, our conduct would be wholly erratic. On the contrary it is argued (1) We are conscious of power to choose as we will and to act as we choose. (2) Freedom of will is involved in the idea of moral obligation.<sup>1</sup>

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<sup>1</sup> Read Harris, *Philosophical Basis of Theism*, pp. 365-376.

“(1) We find freedom supported by a somewhat positive consciousness. (2) We find it also implied in the principles by which

# APPLICATIONS.<sup>1</sup>

**136. ACTIVITY OF CHILDREN (131).** The germs of will are developed in part by bodily activity. In childhood active movements, sports, sufficient exercise, are not only healthful, but control of the body through the will is thus gained and the will itself is exercised. Restlessness of children is natural and should not be unduly restrained or punished; but frequent restraint from activity is not only convenient for the quiet and comfort of others, but it is a necessary education in self-control. All healthful positions, orderly movements, and restraint from noise and confusion in the schoolroom have an educational

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men and societies live. (3) We find its denial leading to skepticism of reason itself. (4) Opposed to these facts we find the necessitarian argument, leading at best to no more than a drawn battle. We may therefore decide in favor of freedom. We may not view it as absolutely proved; yet it is certainly a necessary postulate of reason and conscience, and as such we hold it."

"We see, then, that our freedom is far from absolute. It is limited, on the one hand, by our mental and physical constitution; and, on the other, by the intensity of the desires and impulses which it has to control. These might be so intensified as to execute themselves without permission from the will, and in spite of it. Within these limits freedom has its realm; and even these limits are not fixed. The outcome of volitional action is habit, fixed disposition, settled character. The soul may freely bind itself with chains which it can never undo. Here lie the psychological significance of probation and the tragic element of freedom. Freedom may choose the seed, but it can neither determine nor escape the harvest."—BOWNE.

<sup>1</sup> Read Locke on Education, §§ 32-66, and 76-90; Comenius, pp. 118-121 and 124-127; Richter's *Levana*, §§ 61-71; Fitch, Chap. IV; Spencer's Ed., Chap. III; Bain's Ed., pp. 100-119.

value. There must be, however, frequent intervals of relaxation. The will is cultivated both by vigorous action and by restraint from action.

**137. Example** (131, 132). If it is true, as has been said, that a healthful atmosphere influences toward right action, it is not less true that an unhealthful atmosphere produces the opposite result. A child readily imitates whatever he observes in his companions, and the wise control which judicious parents exercise over the choice of companions for their children can not be too strongly commended. It is often said that sooner or later children must mingle with the world as it is; true, but let that be done when the character is fortified by habits of excellent conduct, and by foresight of consequences. In early childhood moral ideas may be deeply impressed, and that too without marring the happiness of the child.

Teachers should exemplify in their own conduct the principles of Right and a spirit of kindness. For the sake of good mutual influence among pupils all reasonable means should be employed to make the sentiment of the school excellent. Anything false and deceptive on the part of a teacher, even the habit of posing as a martyr in their interest, is quickly detected by pupils and does harm.

**138. AUTHORITY** (131, 132). The inclination of childhood for present enjoyment needs restraint. No number of remote motives placed before children would accomplish all that is to be desired; hence authority intervenes to prevent unwise action and to establish good habits. Nothing else is so harmful as constant indulgence of the whims and inclinations of children, of the freaks of temper or obstinacy or pertinacy;

*except* the continual "No" and "Don't" which are employed by some parents. Children may be allowed proper freedom without letting their inclinations run riot with their will. *It is next to impossible for an untrained child to become a noble and useful citizen, because the seeds of good conduct have not been sown.*

Passionate chiding is frequently indulged in by parent and teacher, but this tends to cultivate only ill-will and obstinacy. Be sparing of commands, but let them be decisive and promptly obeyed. This must be done for the sake of consistency. Without consistency in requirements it is impossible to train the will by authority. To form habit certain things must be uniformly done under the same recurring conditions.

It is often said that the certainty of punishment is more effective than its severity. Undue severity tends to awaken feelings of injustice; certainty tends to form habit. Another principle is, **Let the severity of the punishment correspond with the degree of the offense.** It is always better to employ mild punishment, if that will suffice, but "spoilt" or obstinate children sometimes need summary measures. Locke would reserve the rod for these. **In determining the nature and degree of punishment the motive and the consequence of persistence are to be considered.**<sup>1</sup>

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<sup>1</sup> On the subject of Punishment read Rosenkranz, §§ 38-45. Some of the opinions expressed by Rosenkranz and in the notes by Dr. Harris are as follows: Punishment is justifiable only when all other efforts have failed. Corrective punishment seeks the improvement of the delinquent; retributive punishment seeks the return of the deed upon the doer. Punishment must be modified by the peculiarities of the individual offender, and by the circum-

Excessive use of Authority tends to a reaction when the restraint is removed. Indeed this reaction will naturally occur when the authority has not been excessive,—but only temporarily; habit established by authority will tend to prevail. Too much authority robs one of that independent growth which develops self-control.

**139. MOTIVES** (131). To invite the will by proper motives is the best method for parent, teacher, and later for the individual himself. In another place the motives which are commonly used to influence children were stated to be Fear of Pain, Love of Praise, Hope of Future Good, Desire for Excellence, Duty.

Injudicious praise is nearly as harmful as injudicious punishment. Praise and censure or physical pain, each has its place in the growth of character, and each will be effective so far as it is employed with justice. Constant praise prevents the growth of worthier motives. Unless the occasion demands that the humiliation be public, blame will be more effective if given in private; thus the justice of the censure

stances. Some kind of corporal punishment is most suitable for children, isolation for older boys and girls, and punishment based upon the sense of honor for young men and women. Corporal punishment is the kindest method of dealing with willful defiance, obstinate carelessness, or a really perverted will. Regularity, silence, attention and industry are indispensable for the associated effort of the school, and the pupil who persistently violates these conditions should be isolated from the school. Not personal likes and dislikes but the rational necessity which is over teacher and pupil alike causes the infliction of pain on the pupil.

Herbert Spencer urges the principle of *natural consequences* in the punishment of children.

will be more easily recognized and less antipathy will be aroused.

Sympathy may be used injudiciously. A child who demands sympathy for every trifling hurt is not cultivating courage or self-control. It is a mistake to yield to a child's wishes because he unreasonably cries to have his own way.

Future good and excellence of character should be held before children as soon as they can effectually use them as motives. In history and biography much material can be found for inspiration of youth. Picturing future results leaves impressions in the mind that may come into prominence after a time. In general those motives should be employed which tend to give a noble, self-reliant tone to the mental constitution,<sup>1</sup> and which tend to thoroughly establish right principles of conduct.

It is unwise to expect perfection in children. Their period of education is a period of errors and faults,—a period of mental and moral growth. They are placed in the hands of the teacher, that the errors and faults may be corrected, that their intellectual and moral powers may be developed by proper methods.

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<sup>1</sup> Dr. White says, "The most efficient training of the will involves an appeal to the religious motives, and this inference is strongly supported by the fact that *the religious motives quicken and energize all the lower motives to which they are related*. . . . There has never been a moral code that secured the free obedience of men, that did not derive its highest and most restraining authority from religion; and this is true in pagan as well as in Christian lands."

See further, White's *Pedagogy*, pp. 324 330.

**140. SELF-CONTROL.** This is an age of individual freedom ; the wise self-control of the citizen constitutes the safety of the state. Those who, during their entire period of education, have been controlled wholly either by *authority* or by *love* are not prepared to meet the responsibilities of life. As soon as possible, self-guidance through proper motives must be encouraged and secured. When the powers have been so trained that desire and duty act in the same direction, then Freedom of Will is attained,—freedom in the sense that the will is unfettered by the urgency of wrong motive.

Good character is the end of discipline, and its formation is the most important part of education.

#### EXERCISES.

1. Illustrate the relation of Will to the other faculties.
2. Review in order the office of Perception, Memory, Imagination, Conception, Judgment, Reasoning, Emotion, Desire, Will.
3. Illustrate the fact that Representation is a condition of Desire.
4. Mention some motives of the better class.
5. Give an example of conflict of motives.
6. How may change of scene influence the Will ?
7. How may it be explained that some choose wrong motives in spite of excellent influences ?
8. Show how habit may enslave the Will.
9. Enumerate the ways in which one may build up good character.
10. How might the will of a child be reached whose disposition had been hardened by harmful surroundings ?
11. Analyze Perseverance.
12. Analyze Weakness of Will.
13. Moral responsibility is based upon what ?

**14.** Examine each argument for and against Freedom of Will. Produce other arguments.

**15.** Dangers from lack of restraint.

**16.** Are there any objections to Herbert Spencer's doctrine that punishment should always be a natural consequence of the fault?

**17.** Dangers from excessive praise.

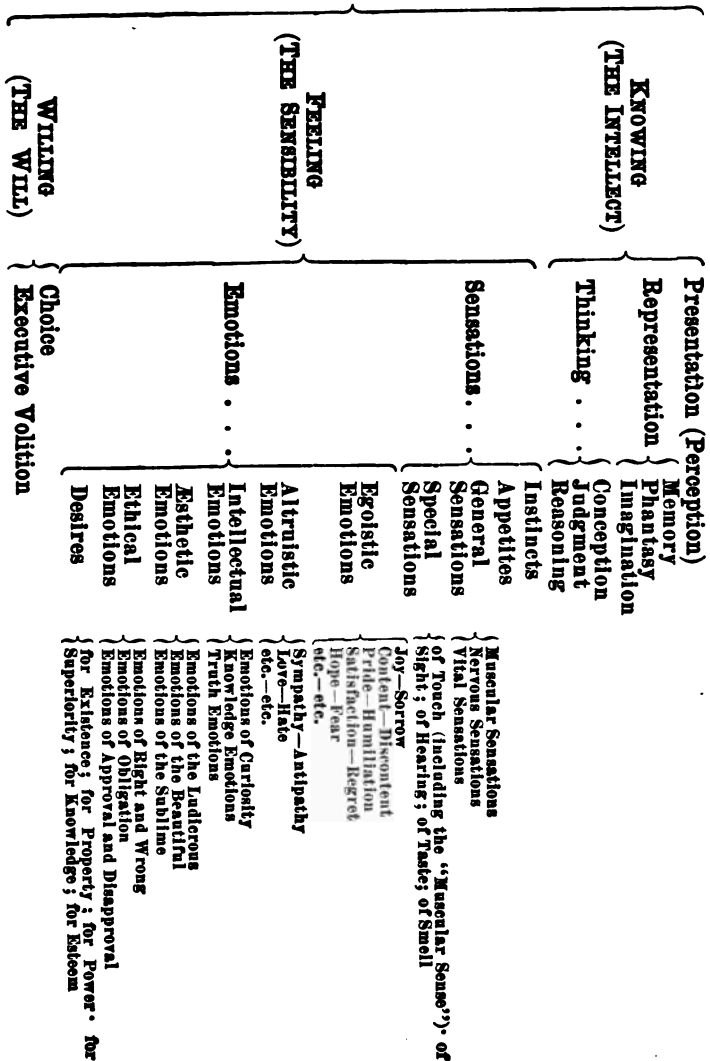
**18.** After children are finally released from the restraints of home and school, they frequently use their freedom unwisely for a time. Does this fact show that authority is harmful?

**19.** What good habits naturally grow from the restraints and requirements of school life?

**20.** How far may charity for the faults of children be exercised?

**21.** Value of a strong will.



**PSYCHICAL ACTIVITIES**

## APPENDIX.

### THE INTUITIONS.

THERE are certain notions called variously Necessary Ideas, Intuitions, Primitive Notions, etc., which seem not to be wholly accounted for by experience; they appear to spring up independently during the growth of knowledge. Such are the ideas of Space, Cause, Time, etc.

There are various theories as to the origin of these ideas. Locke ascribes their origin to sensation and reflection.<sup>1</sup> Herbert Spencer thinks that individual experience alone will not account for them, and concludes that they are inborn in the sense that they represent the experience of our ancestry accumulated and transmitted by heredity.<sup>2</sup> Dr. McCosh, representing still another school of thinkers, holds that a capacity to know certain truths called intuitive is implanted in our nature by the Divine Being, and that these truths arise during the acquisition of our knowledge of objects.

The criteria by which Intuitions are tested are Self-evidence, Necessity, Universality. An intuition is *self-evident*, i.e. it needs no proof; it is *necessary* in the sense

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<sup>1</sup> See McCosh, Intuitions, p. 88.

<sup>2</sup> "The human brain is an organized register of infinitely numerous experiences, received during the evolution of life, or rather, during the evolution of that series of organisms through which the human organism has been reached."—SPENCER, Vol. I, p. 470.

that we must believe it when presented to the mind ; it is *universal* in the sense that all men believe it when occasion calls attention to it. For instance, the belief that a straight line is the shortest distance between two points needs no proof, we must believe the truth, and all intelligent beings must believe it. In imagination we may annihilate matter, but we can not get rid of the idea of Space ; if we try to remove space, space remains behind.

McCosh divides the Intuitions into Primitive Cognitions, Primitive Beliefs, Primitive Judgments, Moral Convictions. The following lists are drawn from the pages of his work, "The Intuitions of the Mind."

## INTUITIONS OF THE MIND.

### PRIMITIVE COGNITIONS.

**BEING.** In all knowledge we know what we know as having existence, which is Being. It is very probable that the first knowledge acquired by the mind is of our own bodily frame through the sensitive organism. Coexisting with every intelligent act of mind there is always a consciousness of Self as having being, existence.

**SUBSTANCE.** Our cognition of substance is original and fundamental. We never know qualities without also knowing substance.

**MODE, QUALITY, PROPERTY, ESSENCE.** (1) It is one of the permanent characters, both of mind and body, that they are ever known as changing ; the given state of any one substance is Mode. Substance implies

mode ; this is a truth intuitively discovered. (2) Substance implies Quality ; this is also an intuitive truth. Certain qualities are known by us intuitively to be in mind or matter ; for example, we know will as in mind and extension as being in matter. (3) The term Property might be appropriated to express the powers of any given substance, as thinking in mind, gravity in body. *Faculty* may be employed for mental powers, *Force* for material powers. (4) There are some things which we know to belong to the Essence of certain objects ; thus we know that being, power, and permanence are essential to all substance, and that certain qualities, such as consciousness and thought, belong to mind, and certain qualities, such as extension and incompressibility, to body.

**PERSONALITY.** The mind ever carries with it a conviction of personality.

**EXTENSION.** The knowledge of extension is involved in every exercise of sense-perception.

**NUMBER.** Every object known, and especially self, is known as *one*. Every other object known is known as another one. Hence arises the idea of number.

**MOTION.** Our perception of motion appears to be intuitive.

**POWER.** We can never know either self or bodies beyond self, except as exercising influence or potency.

#### PRIMITIVE BELIEFS.

**SPACE AND TIME.** Of space and time in the concrete we have an immediate knowledge. By abstraction we may think of space and time as distinct from objects

and events. We possess these original convictions: (1) Time and space have a reality independent of the perceiving mind; (2) Space and time are continuous; (3) Space and time have and can have no limits.

**THE INFINITE.** From the notion of Space, Time, and God arises the idea of the Infinite. As to our convictions, the following propositions may be stated: (1) The mind apprehends and believes that there is and must be something beyond its widest image and concept. (2) We apprehend and are constrained to believe in regard to the objects which we look upon as infinite that they are incapable of augmentation.

#### PRIMITIVE JUDGMENTS.

**RELATION OF IDENTITY.** We note intuitively the relation of Identity. Each believes himself the same person as in childhood; an object has continuous being as long as it exists.

**RELATION OF WHOLE AND PARTS.** The individual intuitive judgments which the mind pronounces on looking at whole and parts may perhaps all be generalized into two principles: (1) The parts make up the whole. (2) The whole is equal to the sum of its parts.

**RELATIONS OF SPACE.** Here belong (1) the axioms of mathematics which relate to limited extension, as, **A straight line is the shortest distance between two points**; (2) certain axioms in regard to motion, as, **All motion is in Space**; (3) the primitive truths that arise from the relation of objects to space, as, **Bodies occupy space**; (4) certain metaphysical judgments as to space, as, **Space is continuous**.

**RELATIONS OF TIME.** Examples: Time is continuous; Every event happens in time.

**RELATIONS OF QUANTITY.** These are relations of equality, difference, and proportion in numbers. The individual intuitive judgments of quantity generalized are stated by Euclid; example, Things which are equal to the same thing are equal to one another.

**RELATIONS OF RESEMBLANCE.** The following is one of the important intuitive propositions: Whatever is predicated of a class may be predicated of all the members of the class.

**RELATIONS OF ACTIVE PROPERTY.** The mind declares, This property implies a substance; This substance will exercise a property; etc.

**RELATION OF CAUSE AND EFFECT.** Every effect has a cause.

### MORAL CONVICTIONS.

#### CONVICTIONS AS TO THE NATURE OF MORAL GOOD.

(1) The moral quality is not given to the action by the mind contemplating it. (2) Moral good is moral good to all intelligences so high in the scale of being as to be able to discern it. (3) Moral good lays an obligation on us to attend to it. (4) The conscience points to an authority above itself. (5) This obligation, when we are led to believe in a Supreme Being, takes the form of law. (6) Moral good is perceived as having desert, as approvable and rewardable. (7) Moral good lies in the region of the will. (8) Moral good is a quality of certain activities proceeding from Free Will. (9) The moral quality of actions can not be resolved into anything simpler.

**ON SIN AND ERROR.** (1) The conscience declares that sin is a reality. (2) Sin is a quality of voluntary acts. (3) Our moral convictions declare that sin is of evil desert, condemnable, punishable.

**RELATION OF MORAL GOOD AND HAPPINESS.** (1) The good is good altogether independent of the pleasure it may bring. (2) Our moral constitution declares that we ought to promote the happiness of all who are susceptible of happiness. (3) Our moral convictions affirm that moral good should meet with happiness. (4) Our moral convictions declare that sin merits pain as a punishment.

**FREEDOM OF THE WILL.** The will is free.

THE END.

